

# PS-LX33/33B/33C/33(A)



Photo : PS-LX33C

The PS-LX33C is supplied with a VL-5 cartridge, while the PS-LX33, PS-LX33B, PS-LX33(A) is supplied with a XL-150 cartridge. The PS-LX33(A) is not supplied with a dust cover.

*PS-LX33*

*AEP Model*

*UK Model*

*PS-LX33C*

*US Model*

*PS-LX33(A)*

*UK Model*

*PS-LX33B*

*AEP Model*

## STEREO TURNTABLE SYSTEM

### SPECIFICATIONS

#### Turntable

Platter	30.4 cm (12 in.), aluminum-alloy diecast
Motor	Linear torque BSL (brushless and slotless) motor
Drive system	Direct drive
Control system	FG servo control system
Speed	33 $\frac{1}{3}$ rpm, 45 rpm
Starting characteristics	Comes to nominal speed within $\frac{2}{3}$ revolution (33 $\frac{1}{3}$ rpm)
Wow and flutter	0.04% (WRMS)* 0.045% (WRMS) $\pm 0.055\%$ (DIN)
Signal-to-noise ratio	75 dB (DIN-B)
Automatic system	Lead-in, return, reject, repeat

#### Tonearm

Type	Statically balanced
Pivot-to-stylus length	216.5 mm (8 $\frac{5}{8}$ in.)
Overhang	16.5 mm ( $2\frac{1}{32}$ in.)
Tracking force adjustment range	0 - 3 g
Cartridge shell weight	5.2 g
Cartridge weight range (including cartridge shell)	7.5 - 12 g

— Continued on page 2 —

\* This new measuring method concerns only the turntable assembly, including the platter. It excludes wow and flutter caused by the tonearm, the cartridge, or the record. Measured by obtaining signal from magnetic pick-up head.



## SERVICE MANUAL

# PS-LX33/33B/33C/33(A)

## Cartridge VL-5 (PS-LX33C)

Type	Moving magnet type
Frequency response	10 Hz to 20 kHz
Channel separation	20 dB at 1 kHz
Output voltage	3.5 mV at 1 kHz, 5 cm/sec.
Load impedance	47 to 100 kilohms
Tracking force	1.5 to 2.5 g (2 g recommended)
Stylus	Sony ND-5G (conical 0.6 mil diamond)
Weight	5.0 g

## Cartridge XL-150 (PS-LX33, PS-LX33B, PS-LX33 (A))

Type	Moving magnet type
Frequency response	10 Hz to 25 kHz
Channel separation	20 dB at 1 kHz
Output voltage	3 mV at 1 kHz, 5 cm/sec., 45°
Load impedance	50 to 100 kilohms
Tracking force	1.3 to 2.3 g (1.8 g recommended)
Stylus	Sony ND-150G (conical 0.6 mil diamond)
Weight	8.8 g

## General

Power requirements	US model: 120 V ac, 60 Hz AEP model: 220 V ac, 50/60 Hz UK model: 240 V ac, 50/60 Hz
Power consumption	8 W
Dimensions	Approx. 430 × 110 × 355 mm (w/h/d) (17 × 4 <sup>3</sup> / <sub>8</sub> × 14 in.) including projecting parts and controls
Weight	Approx. 4.9 kg (10 lbs 13 oz), net Approx. 6.2 kg (13 lbs 11 oz), in shipping carton

## FEATURES

### Automatic turntable system

Automatic lead-in, return, reject and repeat functions are activated by merely pushing the buttons.

### Linear torque BSL motor

Direct drive system with Sony's unique BSL (brushless and slotless) motor which has an extremely low noise level, and whose smoothness virtually eliminates wow and flutter. The motor's high torque assures a quick attainment of 33<sup>1</sup>/<sub>3</sub> rpm after only <sup>2</sup>/<sub>3</sub> revolution.

### Low-mass tonearm and cartridge

The low-mass tonearm and cartridge allow the stylus to track with greater accuracy.

### Resilient feet

The turntable has resilient feet that isolate the mechanism from external shock and vibration.

### Disc centering guides

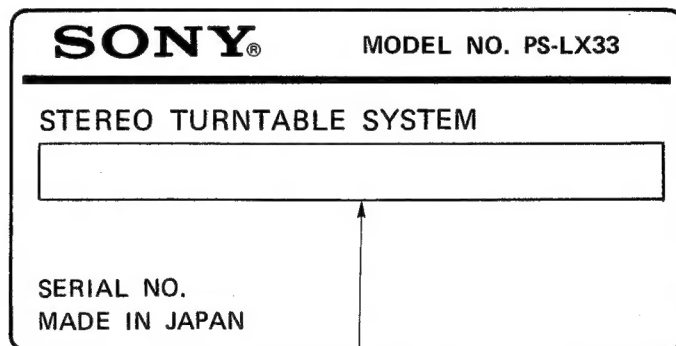
Disc centering guides facilitate placing a 30 cm record over the center spindle.

### Easily-adjusted tracking force (PS-LX33, PS-LX33B, PS-LX33 (A))

Using the supplied tracking force setting guide, it is easy to position the counterweight so that the precise tracking force for the supplied cartridge will be applied.

## MODEL IDENTIFICATION

### Specification Label



US model :	AC 120V	60Hz	8W
AEP model :	AC 220V	~ 50/60Hz	8W
UK model :	AC 240V	~ 50/60Hz	8W

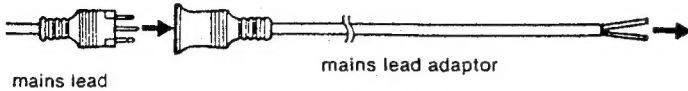
## SECTION 1 OUTLINE

### 1-1. OUTLINE

#### For the Customers in the UK model

The mains lead plug of your unit is a 3-pin type especially designed to be connected only to the Sony amplifier such as the TA-AX22 or the TA-AX44. These components have receptacles on the rear to receive this plug to supply mains power to other components of your audio system.

To connect the unit directly to a mains power point in your house, firmly insert the 3-pin plug into the supplied mains lead adaptor.



#### CAUTION

Connect the 3-pin plug only to the mains outlet on the components mentioned above or to the supplied mains lead adaptor.

#### Important

The wires in the mains lead adaptor are coloured in accordance with the following code:

Blue: Neutral

Brown: Live

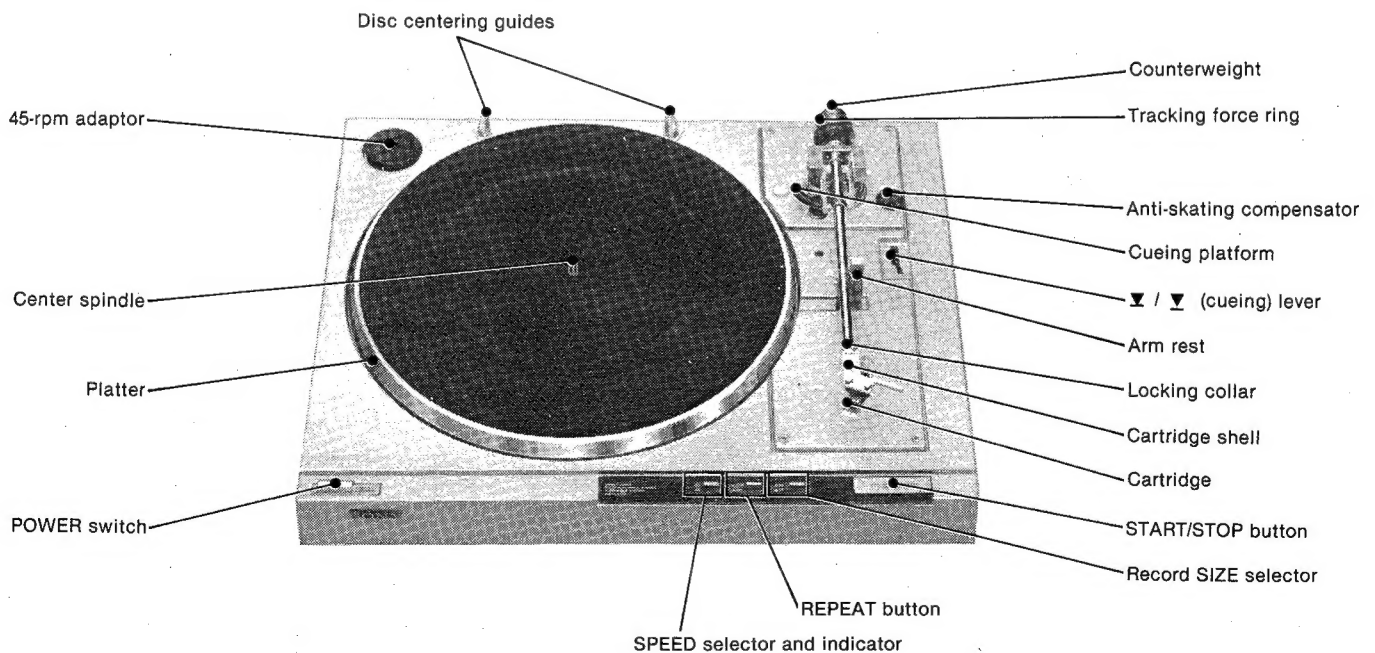
As the colours of the wires in the mains lead adaptor of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

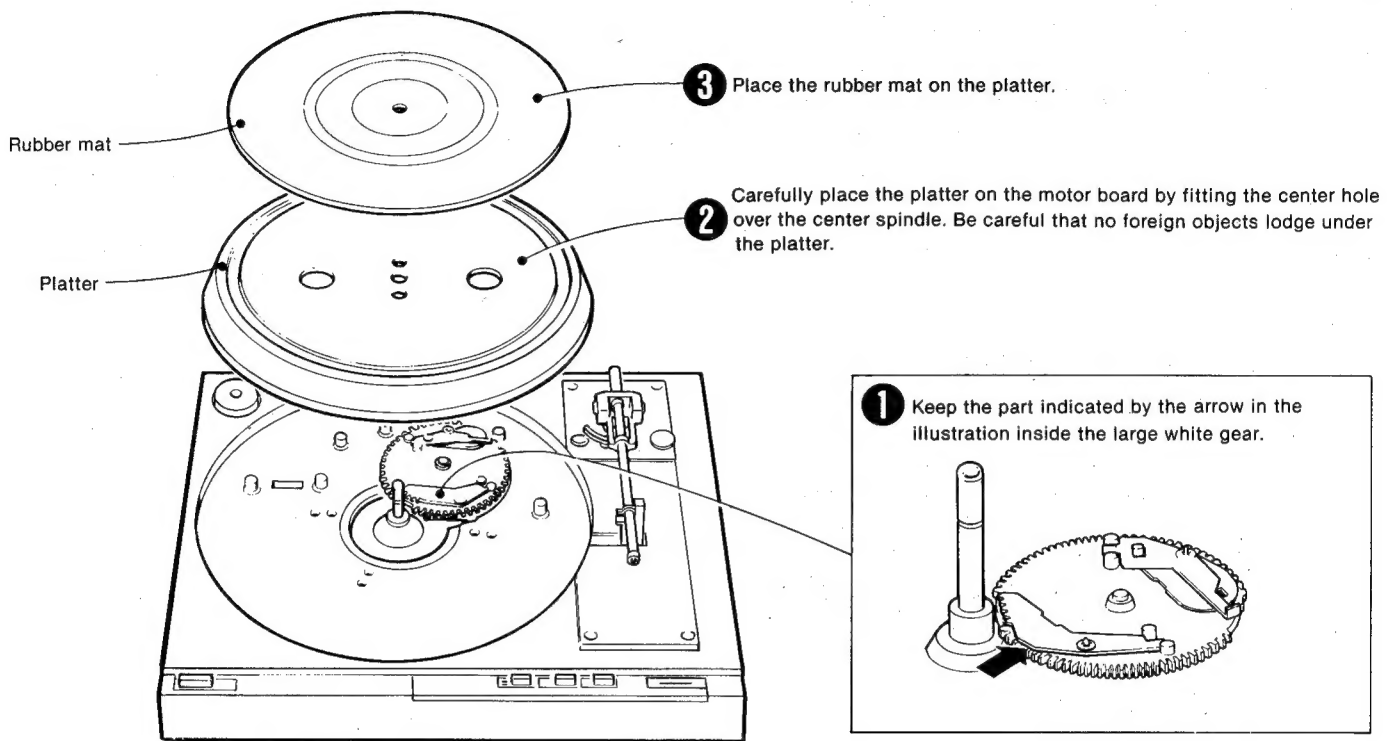
## PARTS IDENTIFICATION

The photo below shows the assembled PS-LX33C turntable.



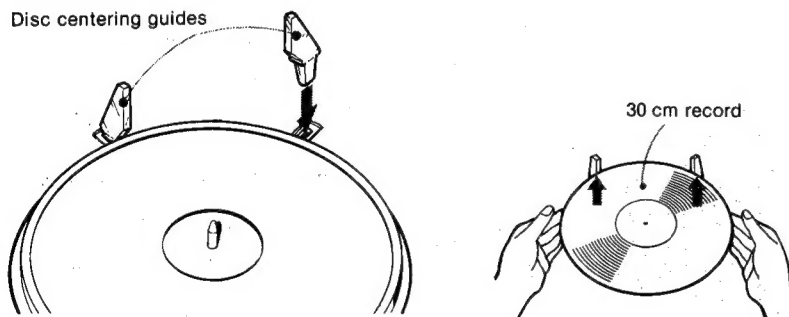
## TURNTABLE ASSEMBLY

Do not connect the power cord or the connecting cords until the turntable has been completely assembled.  
Remove all packing material and wipe off the cabinet.  
Save the packing box and materials for possible future use.  
The numbers in the illustration refer to the sequence of assembly.



### Disc centering guide installation

Insert the supplied disc centering guides as illustrated.



## CARTRIDGE INSTALLATION

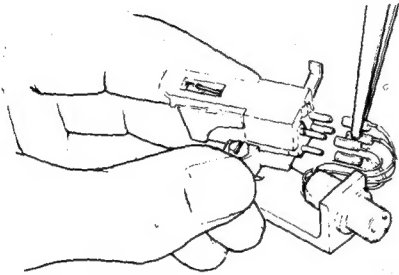
### For the PS-LX33C

The supplied cartridge has been installed correctly on the cartridge shell at the factory. So the following procedures should be skipped unless you replace the cartridge. The weight range of the cartridge which can be mounted with the supplied cartridge shell is 2.3 to 6.8 g.

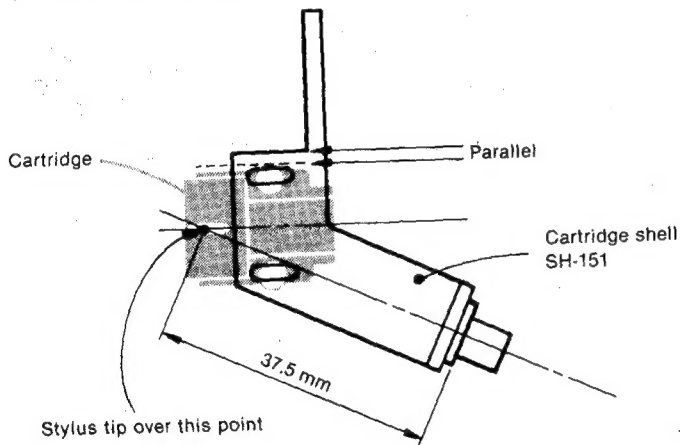
- 1 Connect the lead wires of the shell to the corresponding pins on the cartridge.

#### Wires

Cartridge pins	
White. . . . .	White, L (Left channel signal)
Blue. . . . .	Blue, LE or G (Left channel ground)
Red. . . . .	Red, R (Right channel signal)
Green. . . . .	Green, RE or G (Right channel ground)



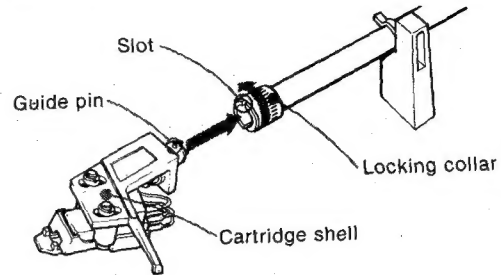
- 2 Temporarily install the cartridge into the cartridge shell with the supplied mounting screws.
- 3 Place the cartridge shell exactly over the diagram below and adjust the position of the cartridge so that the stylus tip is just over the point where the lines cross. Then tighten the screws down.



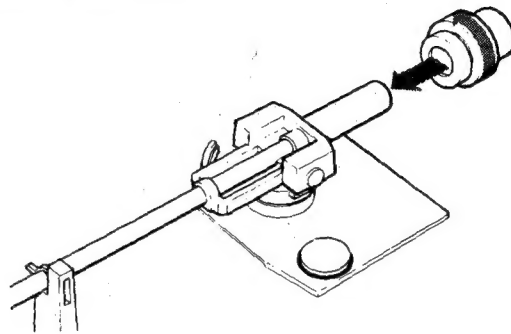
## ONEARM ASSEMBLY

### For the PS-LX33C

- 1 Secure the tonearm to the arm rest.
- 2 Plug the shell into the tonearm, fitting the guide pin on the shell with the upper slot of the tonearm. Turn the locking collar until the shell is firmly locked.

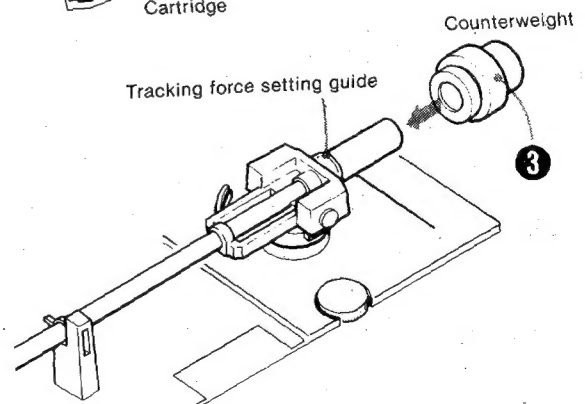
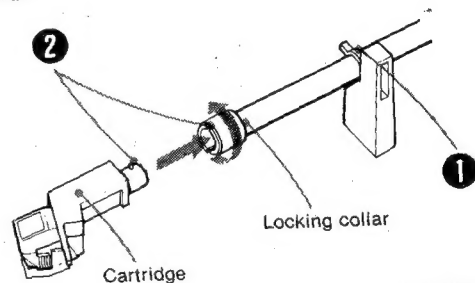


- 3 Insert the counterweight by turning it.



### For the PS-LX33, PS-LX33(A), PS-LX33B

- 1 Secure the tonearm to the arm rest.
- 2 Plug the supplied cartridge into the tonearm and turn the locking collar counterclockwise until the cartridge is firmly locked.
- 3 Insert the counterweight and screw it up to the tracking force setting guide.



## TONEARM ADJUSTMENT

### Notes

- The turntable must be on a level surface while the tonearm is being adjusted.
- Be careful not to damage the stylus tip while making adjustments.

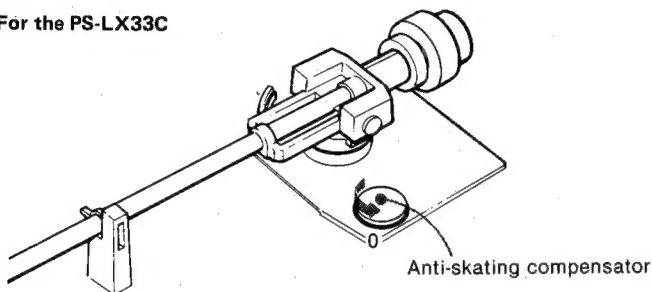
### TONEARM BALANCE ADJUSTMENT

It is critically important for good sound reproduction that the stylus traces the record groove accurately and with the proper tracking force. To do this, the tonearm must first be balanced so that the proper tracking force can be applied.

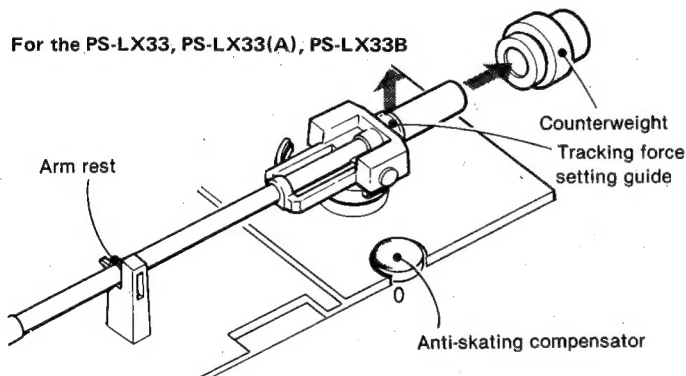
To balance the tonearm, proceed as follows:

- 1 Secure the tonearm to the arm rest. (For the PS-LX33C)
- 1 Secure the tonearm to the arm rest and remove the counterweight and the tracking force setting guide. (For the PS-LX33, PS-LX33(A), PS-LX33B)
- 2 Set the anti-skating compensator to "0".

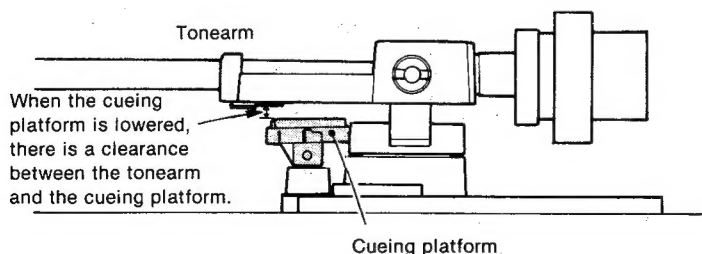
For the PS-LX33C



For the PS-LX33, PS-LX33(A), PS-LX33B

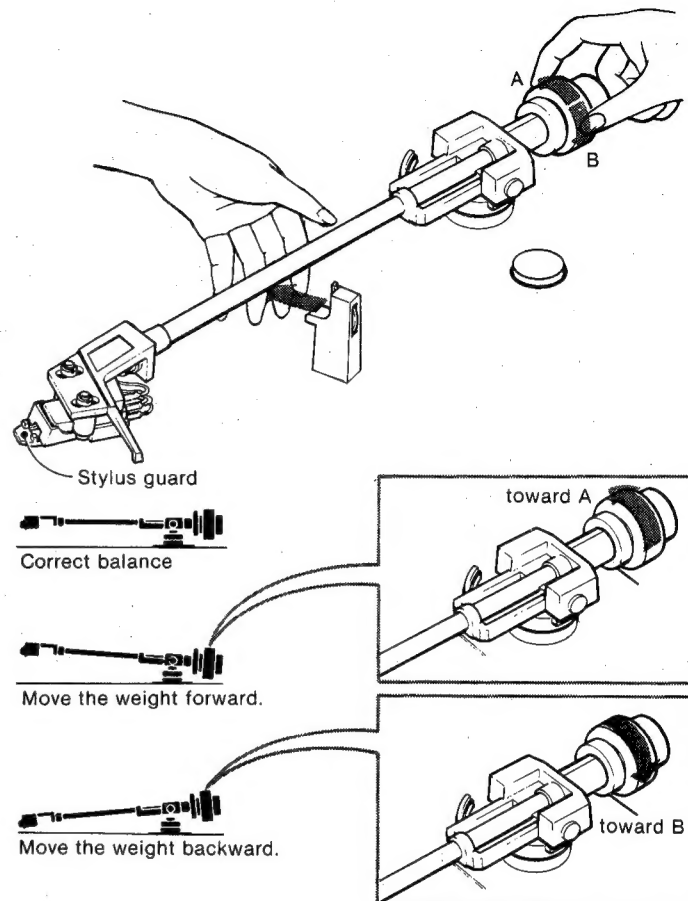


- 3 Set the cueing lever to the  $\nabla$  position.
- 4 Connect the power cord to an ac outlet and press the POWER switch (ON).
- 5 Press the START/STOP button. This will cause the turntable to rotate and the cueing platform to lower. After the cueing platform has lowered, press the POWER switch again to turn the unit off and stop the turntable by hand.



- 6 Remove the stylus guard and release the tonearm from the arm rest.

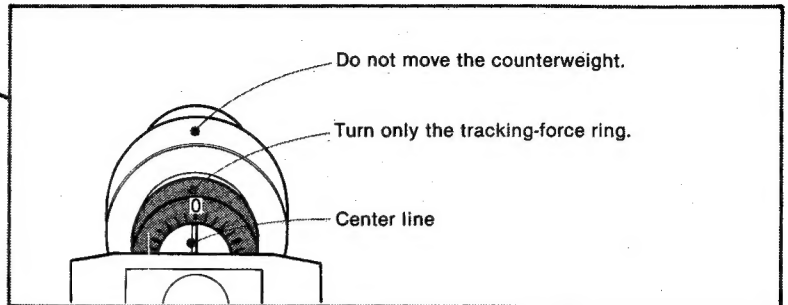
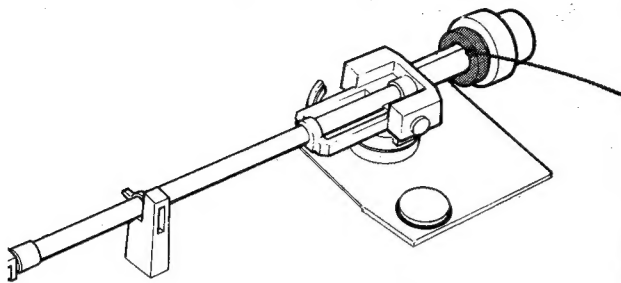
- 7 Adjust the position of the counterweight by turning it. Release the tonearm gently and check the balance. Repeat this step until the arm is balanced.





⑧ After the tonearm is balanced, replace the stylus guard and secure the tonearm to the arm rest.

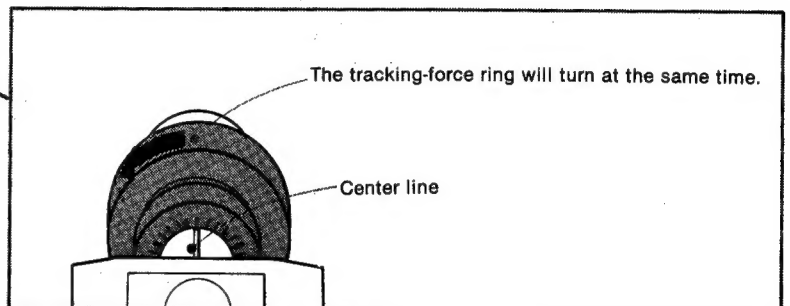
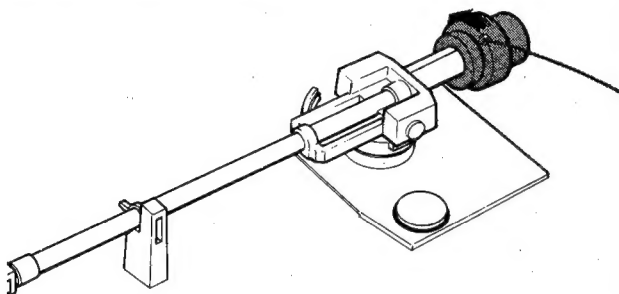
⑨ While making sure that the counterweight remains in the balanced position, carefully turn the tracking force ring until the "0" indication is aligned with the center line on the tonearm.



### TRACKING FORCE\*1 ADJUSTMENT

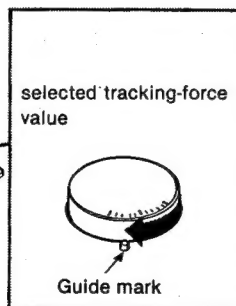
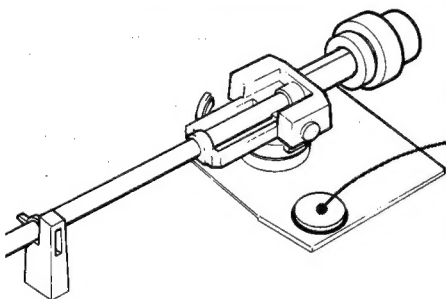
Turn the counterweight as illustrated so that the recommended tracking force for your cartridge is aligned with the center line on the tonearm. The maximum tracking force available is 3 grams.

- The recommended tracking force for the VL-5 cartridge (supplied only with the PS-LX33C) is 2 grams.
- The recommended tracking force for the XL-150 cartridge (supplied with the PS-LX33, PS-LX33B or PS-LX33(A)) is 1.8 grams.



### ANTI-SKATING\*2 COMPENSATION

Turn the anti-skating compensator so that the guide mark is aligned with the selected tracking force value.



### When the adjustment is complete

Press the POWER switch. The turntable will start rotating. Then press the START/STOP button to lift the cueing platform and stop the turntable rotation.

#### \*1 Tracking force

Tracking force is the vertical force applied to the stylus tip so that it can accurately trace a record groove.

The tracking force is applied after the tonearm is balanced.

Since the proper tracking force differs depending on which cartridge is installed, be sure to apply the tracking force recommended for your cartridge. If the tracking force is too light, the stylus will skip grooves. When it is too heavy, the stylus tip and the record will wear excessively. Note that if you play a record at a temperature below 10°C (50°F), or if the record to be played is badly warped, the tracking force should be increased by 20%.

#### \*2 Anti-skating compensator

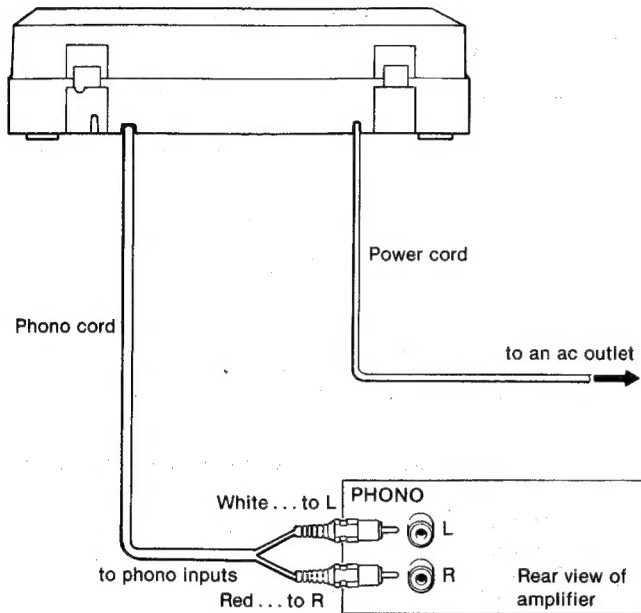
While the record is being played, friction between the record groove and the stylus produces a force that tends to drive the tonearm toward the center of the record.

The anti-skating compensator cancels this force. The anti-skating force should be the same value as the tracking force.

Incorrect adjustment of the anti-skating compensator results in sound distortion and uneven wear on both the stylus and the record.

## CONNECTIONS

- Turn off the amplifier before making connections.
- Be sure to insert the cable connectors firmly into the jacks. Loose connections may cause hum and noise.
- Connect the red plug of the connecting cord to the right-channel jack [R] of the amplifier and the white plug to the left-channel jack [L]. Otherwise, the right and left channels will be reversed.
- Leave a little slack in the connecting cord to allow for inadvertent shock or vibration.

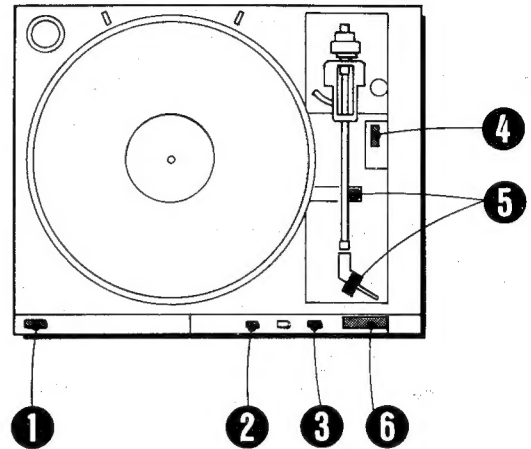


## RECORD PLAYING

### PREPARATION

- Place a record on the platter. For 17 cm (7 inch) records, put the supplied 45-rpm adaptor over the center spindle.
- Lower the amplifier volume and set the input selector to PHONO.

### AUTO PLAY



- 1 Press the POWER switch (ON).
- 2 Select the correct record speed. The indicator of the selected speed will be illuminated.
- 3 Select the correct record size.
- 4 Set the cueing lever to the  $\nabla$  position.
- 5 Unlock the arm rest latch and remove the stylus guard.
- 6 Press the START/STOP button. Play will begin.

When the tonearm reaches the end of the record, it will automatically return to the arm rest and the turntable will stop.

### Note

After when the turntable has been subjected to strong vibration or shock, the record size selection may malfunction as follows.

- The tonearm may lower onto the platter even if the START/STOP button has not been pressed.
- The tonearm may lower on the point for a 17 cm record even if the 30 cm record size has been selected.

If this happens, press the START/STOP button to return the tonearm to the arm rest, and press the button again to restart play.



## REPLACING THE STYLUS

### TO BEGIN RECORD PLAY AT A PARTICULAR POINT—Manual play

- ① Press the POWER switch (ON).
- ② Select the correct record speed.  
The indicator of the selected speed will be illuminated.
- ③ Set the record SIZE selector to the 30 cm position.
- ④ Set the cueing lever to the **▼** position.
- ⑤ Unlock the arm rest latch and remove the stylus guard.  
Bring the tonearm to the point over the record at which you want to start play.
- ⑥ Press the START/STOP button. Play will begin.

When the tonearm reaches the end of the record, it will automatically return to the arm rest and the turntable will stop.

#### Note

If you bring the tonearm too near the record label while the turntable is rotating, the tonearm may return to the arm rest as a result of having activated the automatic return mechanism.

### TO LIFT UP THE STYLUS DURING PLAY

To listen to another part of the record being played, or to lift up the stylus on a record for a brief moment and start playing from the same point, set the cueing lever to the **▼** position. The tonearm will be lifted up. To lower it again, set it to the **▼** position.

### TO STOP DURING PLAY

Press the START/STOP button. The tonearm will return to the arm rest and the turntable will stop rotating.

### TO REPEAT PLAY

Press the REPEAT button after starting play. The tonearm continues repeat play unless the button is pressed again to turn off the repeat function. To stop during repeat play, press the REPEAT button to release it, then press the START/STOP button. (If you press the REPEAT button in the stop mode, the tonearm will lower onto the platter even if the START/STOP button has not been pressed.)

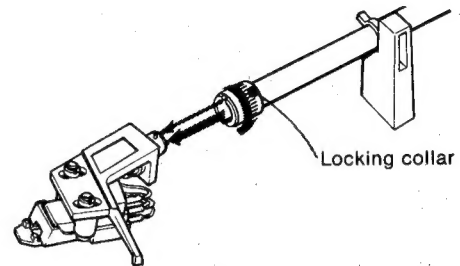
### For the PS-LX33C

The stylus will lose its effectiveness and begin to damage records after about 400 hours of use.

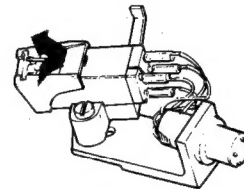
For the VL-5 cartridge (supplied with the PS-LX33C), an ND-5G replacement stylus is available at your Sony dealer.

Handle the stylus carefully as it is very delicate. Install the replacement stylus as follows.

- ① Lower the sound level or turn the amplifier off.
- ② Secure the tonearm to the arm rest and separate the cartridge shell from the tonearm by turning the locking collar in the direction of the arrow.

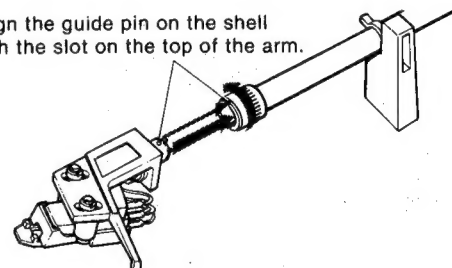


- ③ Detach the stylus assembly by grasping it between the thumb and forefinger and pulling gently in the direction of the arrow.



- ④ Insert the new stylus into the cartridge.
- ⑤ Plug the cartridge shell into the tonearm and turn the locking collar counterclockwise until the shell is locked.

Align the guide pin on the shell with the slot on the top of the arm.



## For the PS-LX33, PS-LX33(A), PS-LX33B

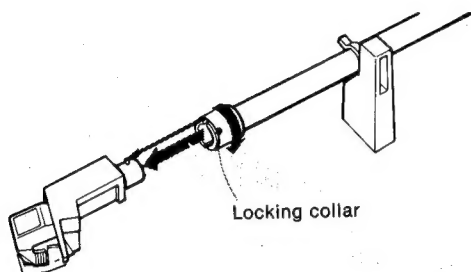
The stylus will lose its effectiveness and begin to damage records after about 400 hours of use.

An ND-150G replacement stylus is available at your Sony dealer.

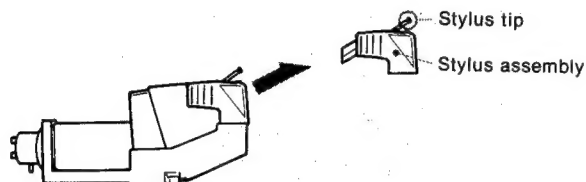
Handle the stylus carefully as it is very delicate.

Install the replacement stylus as follows.

- 1 Lower the sound level or turn the amplifier off.
- 2 Secure the tonearm to the arm rest and separate the cartridge from the tonearm by turning the locking collar in the direction of the arrow.

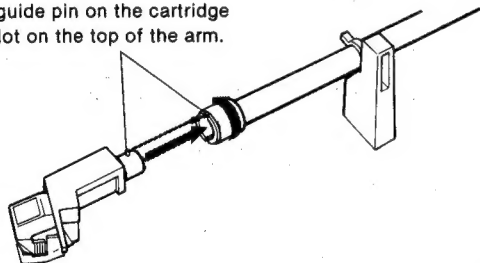


- 3 Detach the stylus assembly by grasping it between the thumb and forefinger and pulling gently in the direction of the arrow.



- 4 Insert the new stylus into the cartridge.
- 5 Plug the cartridge into the tonearm and turn the locking collar counterclockwise until the cartridge is locked.

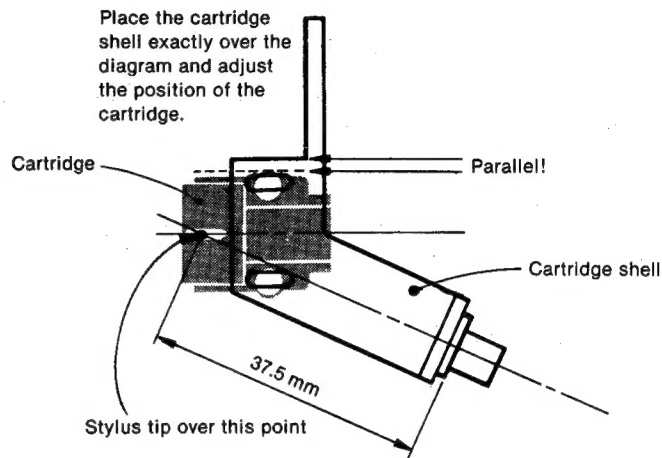
Align the guide pin on the cartridge with the slot on the top of the arm.



## INSTALLING A CARTRIDGE OTHER THAN THE ONE SUPPLIED

Since the cartridge supplied with this turntable is unified with the shell, if you want to use a different cartridge, you will need an appropriate cartridge shell (Sony SH-151, 5.2 g). The total weight of the cartridge and shell must be between 7.5 grams and 12 grams. Connect the lead wires of the shell to the corresponding pins on the cartridge and install the cartridge in the shell as illustrated.

For details on the connection of the lead wires, refer to the instruction manuals of the cartridge and shell.



After installing the new cartridge and shell, adjust the tonearm's balance, tracking force and anti-skating compensation as follows.

## 1-2. CIRCUIT DESCRIPTION

### MOTOR

The method for detecting change in turntable rotation speed for the BSL (Brushless and Slotless) DC servo motor on this set is different from the conventional method (detection by MG head fixed to the frame). On this set it is performed by the FG board fixed to the stator.

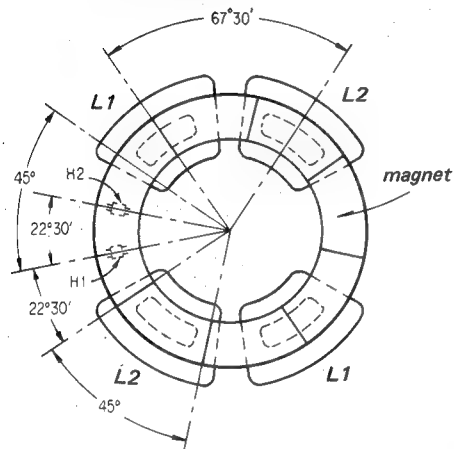
For this purpose, 256 poles of magnetization (SN alternately) are shallowly layered on the surface of the drive magnetizer (8 poles alternately SN) on the magnet used to rotate the rotor.

The frequencies detected at the FG board are:

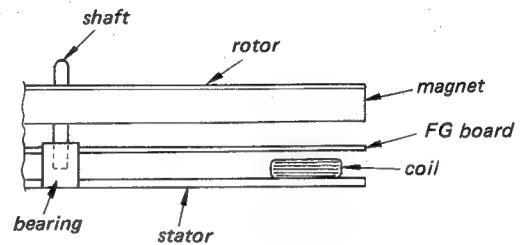
33  $\frac{1}{3}$  rpm ..... 71.1 Hz

45 rpm ..... 96.0 Hz

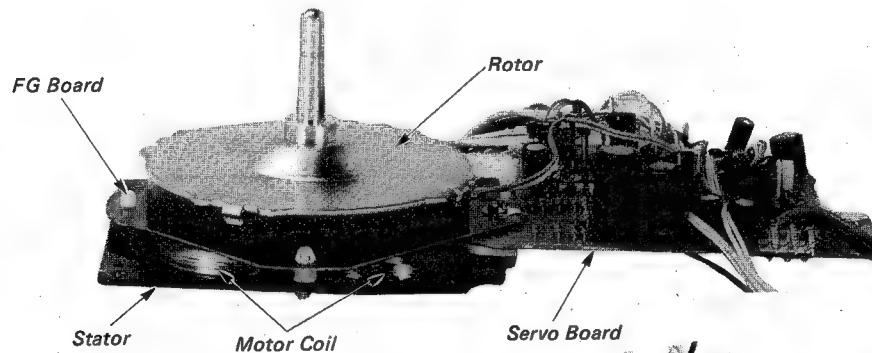
**Motor Internal Diagram (upper surface)**



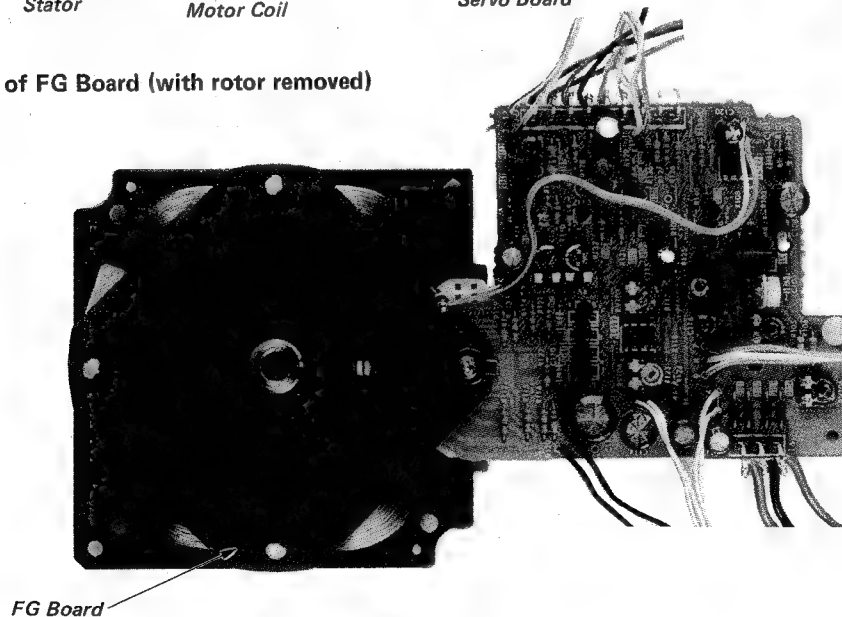
**(cross-section)**



**Motor External View**



**External View of FG Board (with rotor removed)**



# ELECTROMOTANCE GENERATED ON FG BOARD

On the FG board, if the radial pattern **A** in Figure 1 is considered as one conductor, when the rotor rotates, the conductor cuts the magnetic flux, electromotance is generated on the conductor, and its direction changes from the Fleming's right-hand rule to that in Figure 1.

Overall, the spacing of the radial pattern on the FG board and the rotation speed detection sine-wave magnet peak is the same, so the electromotance generated in all of the patterns is directed in a uniform direction as shown in Figure 2 if the pattern is considered as one loop.

Therefore, the electromotance generated on the FG board is equivalent to 256 times that generated on the one pattern **A** (circular integral method).

The frequencies detected on the FG board are obtained as follows.

For one radial pattern, sine-wave electromotance is generated one time for 2 SN poles.

Therefore, when the rotor rotates one time:

$$256 \text{ (poles)} \div 2 = 128 \text{ (times)}$$

For 45 rotations:

$$128 \text{ (times)} \times 45 \text{ (rpm)} \div 60 \text{ (seconds)} = 96 \text{ (Hz)}$$

In the same way, for  $33\frac{1}{3}$  rotations:

$$128 \text{ (times)} \times 33\frac{1}{3} \text{ (rpm)} \div 60 \text{ (seconds)} = 71.1 \text{ (Hz)}$$

FG Board Pattern Diagram (pattern surface)

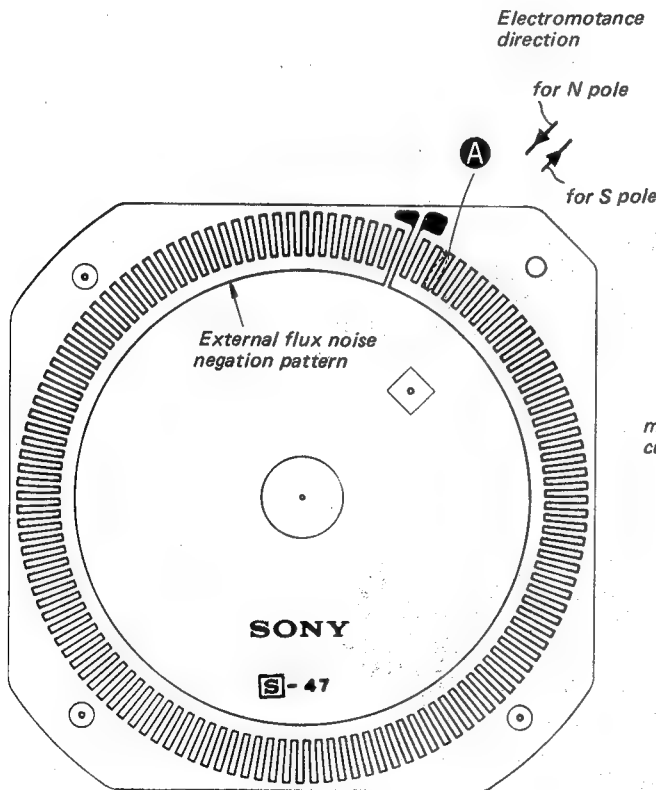


Fig. 1

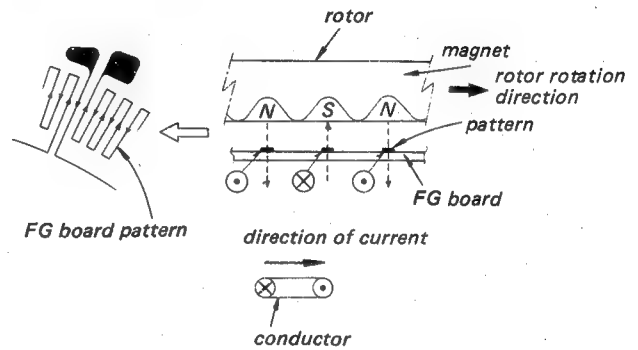
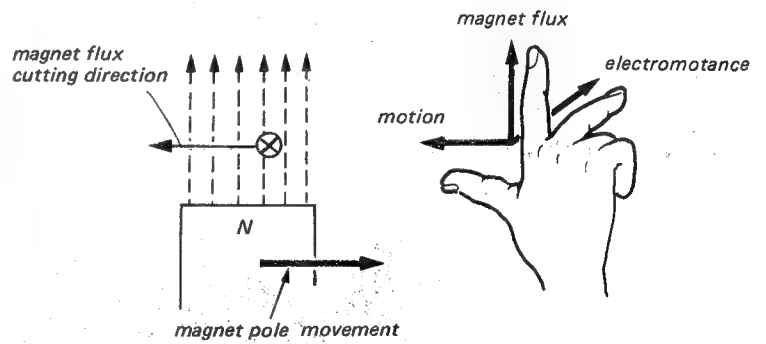
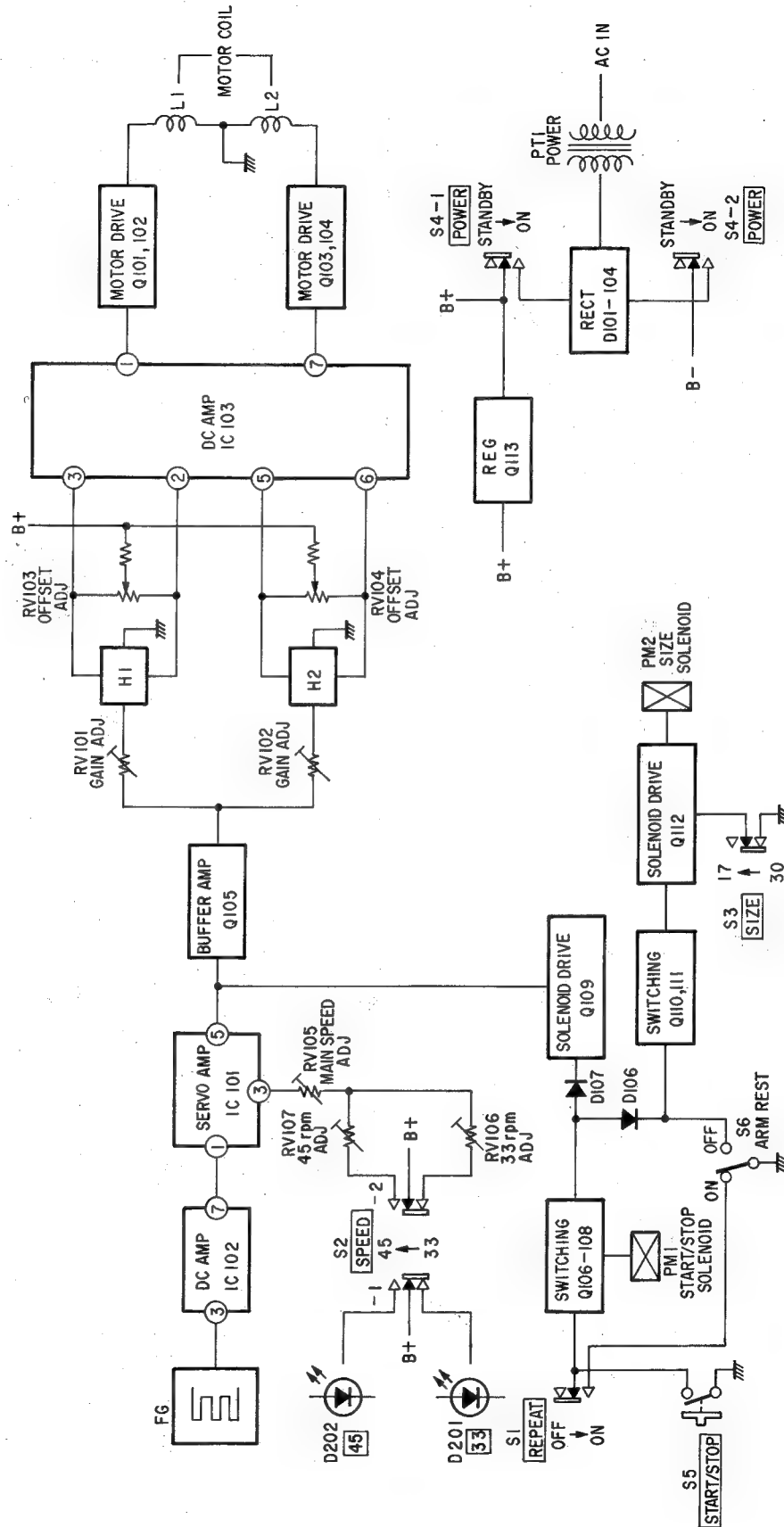


Fig. 2



Fleming's right-hand rule

### 1-3. BLOCK DIAGRAM

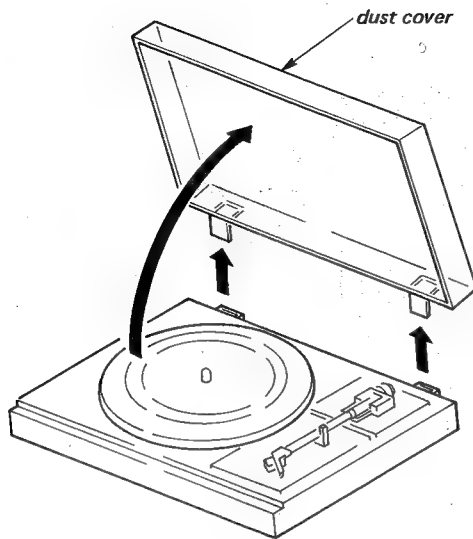


## SECTION 2 DISASSEMBLY

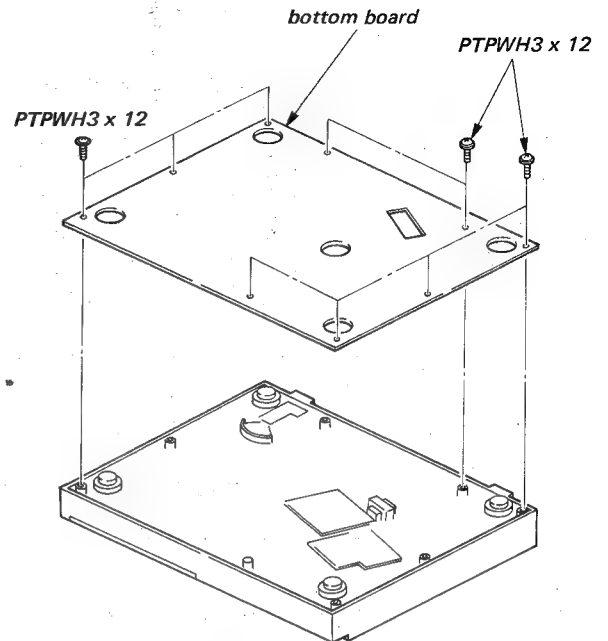
### 2-1. REMOVAL

**Note:** Follow the disassembly procedure in the numerical order given.

#### DUST COVER

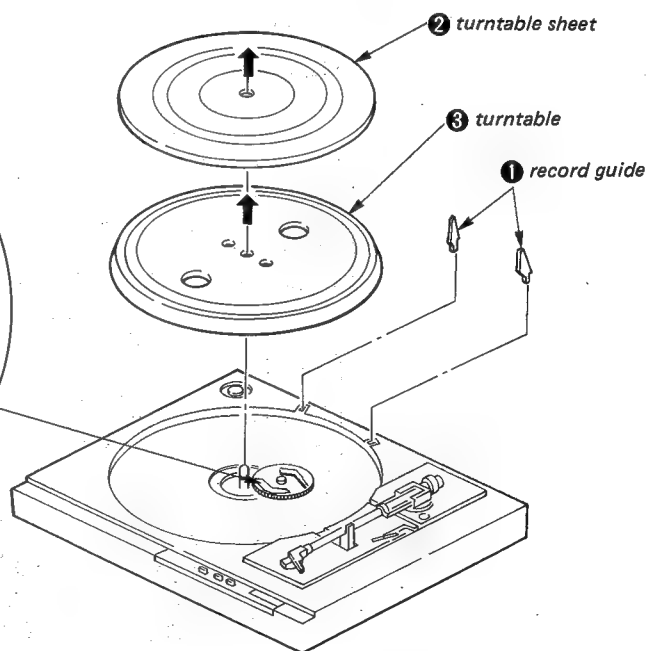
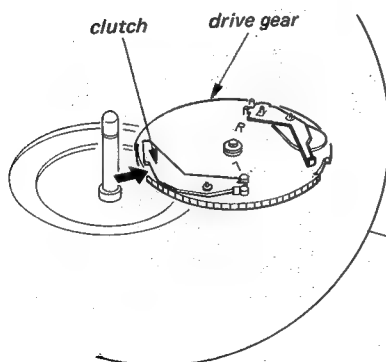


#### BOTTOM BOARD

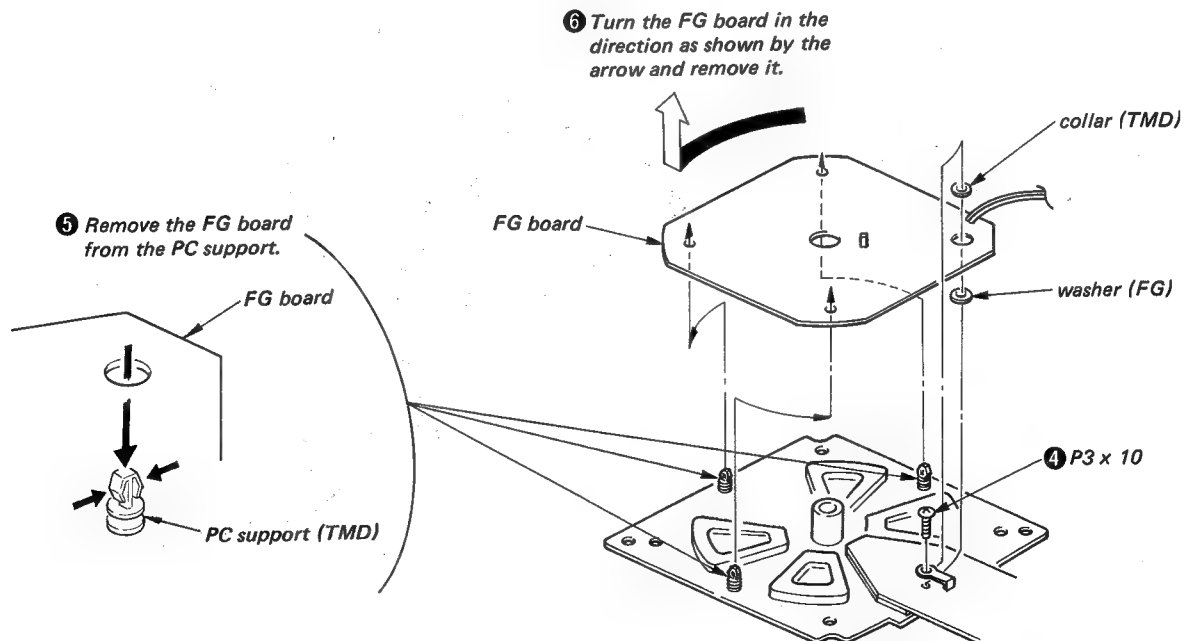
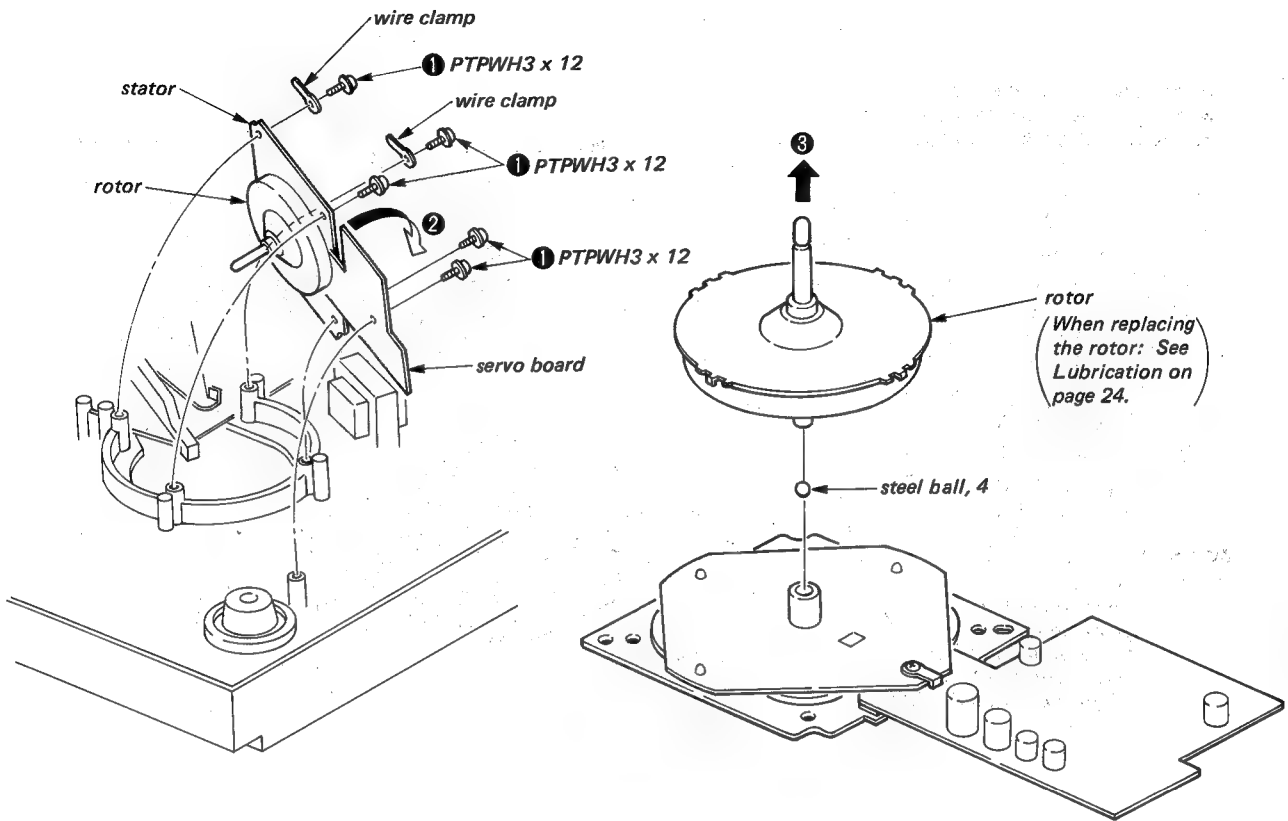


#### TURNTABLE

**Caution for installation:**  
Move the clutch in the direction  
as shown by the arrow and put  
it the inside of the drive gear.



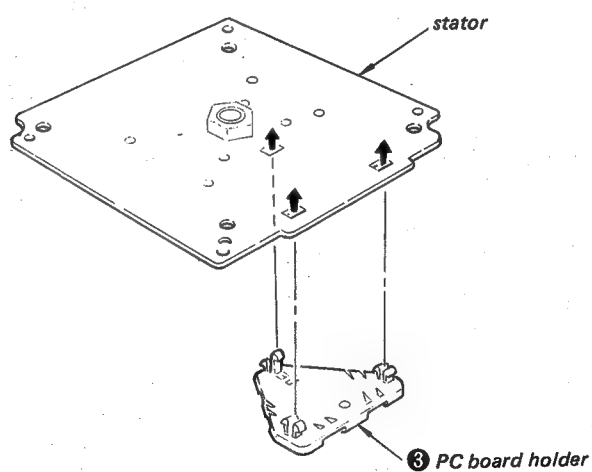
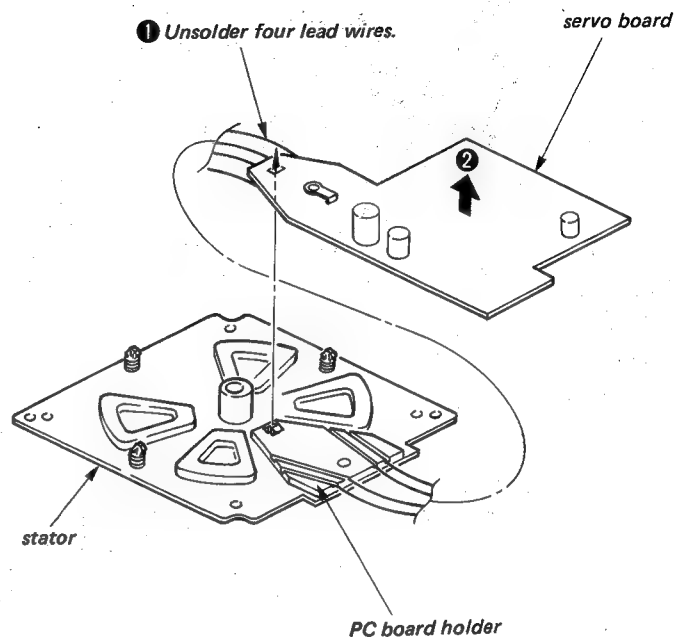
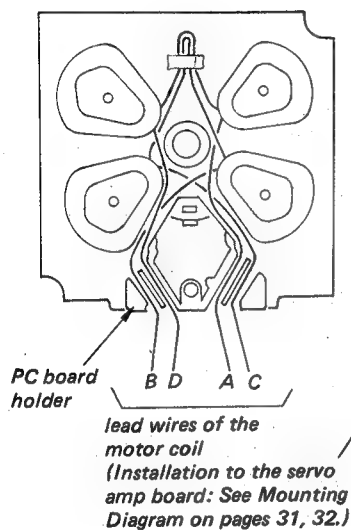
# ROTOR, FG BOARD





# **SERVO BOARD, STATOR**

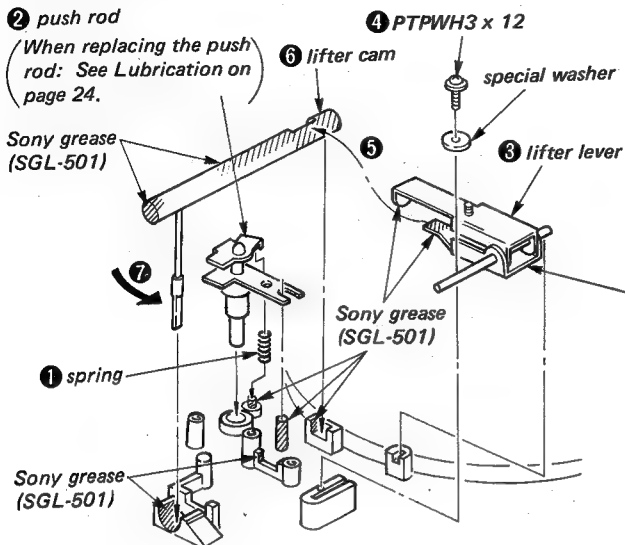
*When installing, run the lead wires of the motor coil through the grooves of the PC board holder.*



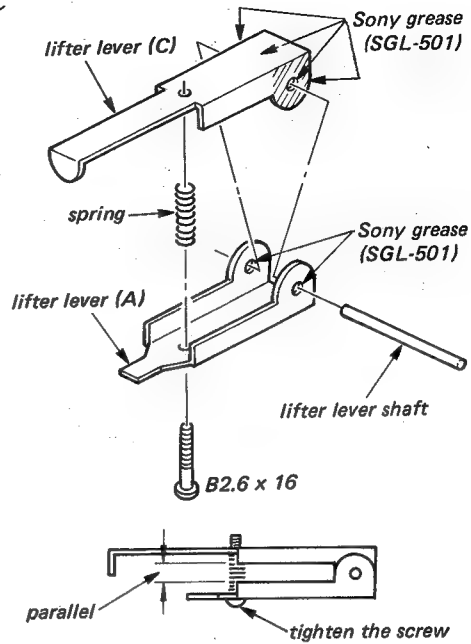
## 2-2. INSTALLATION

### PUSH ROD, LIFTER LEVER

If necessary, apply Sony grease (SGL-501) to the specified portion.

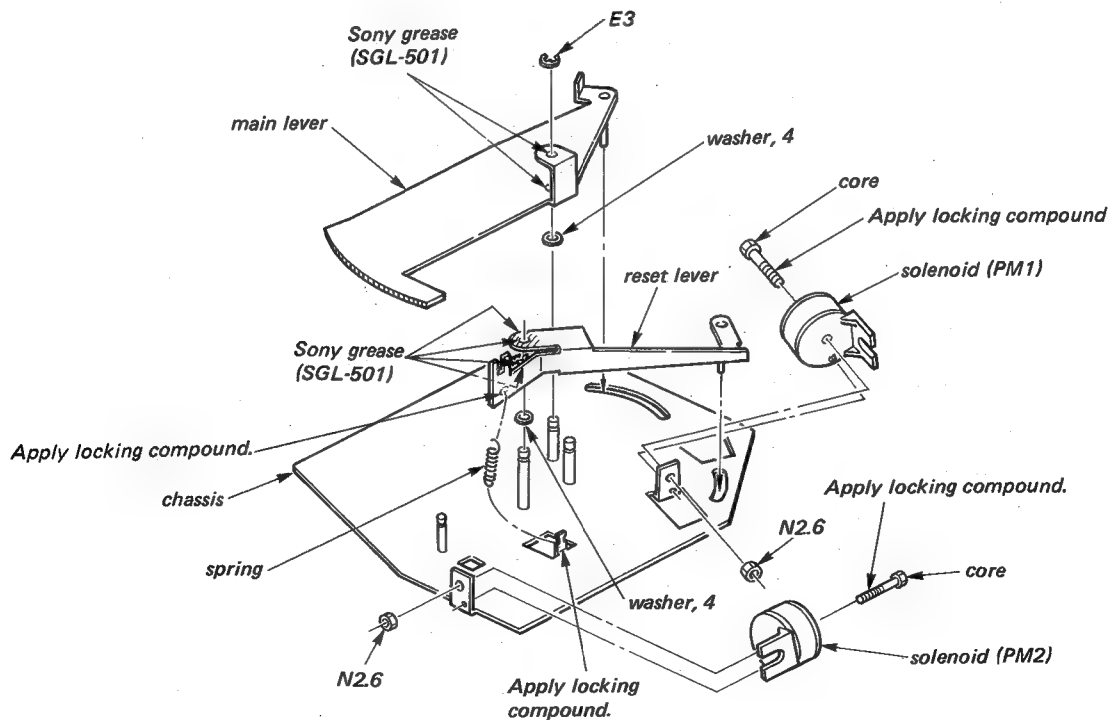


— Note on replacing lifter lever —

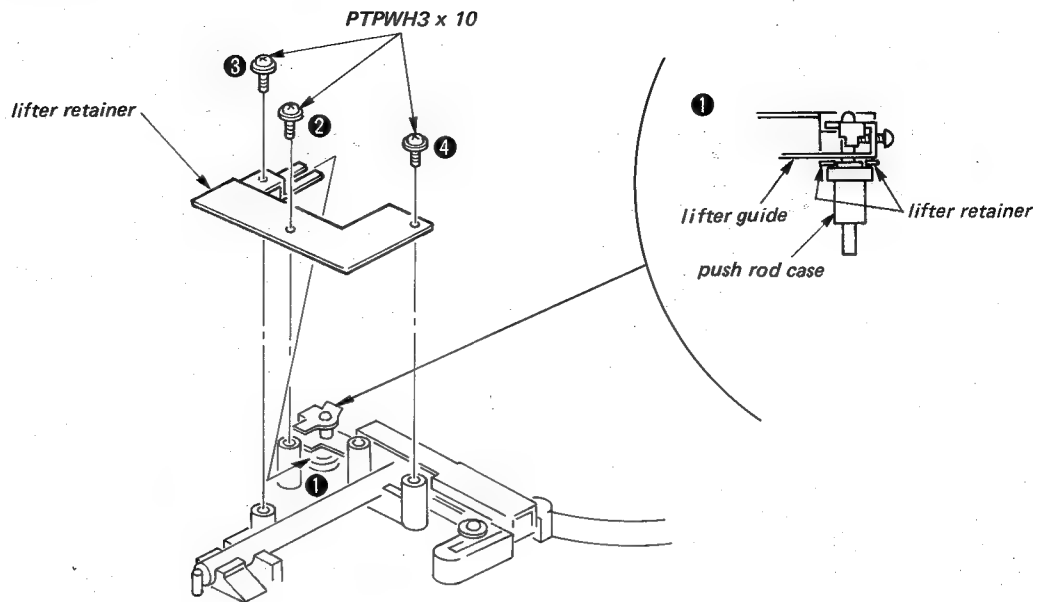


### MAIN LEVER, RESET LEVER, SOLENOID

If necessary, apply Sony grease (SGL-501) to the specified portion.

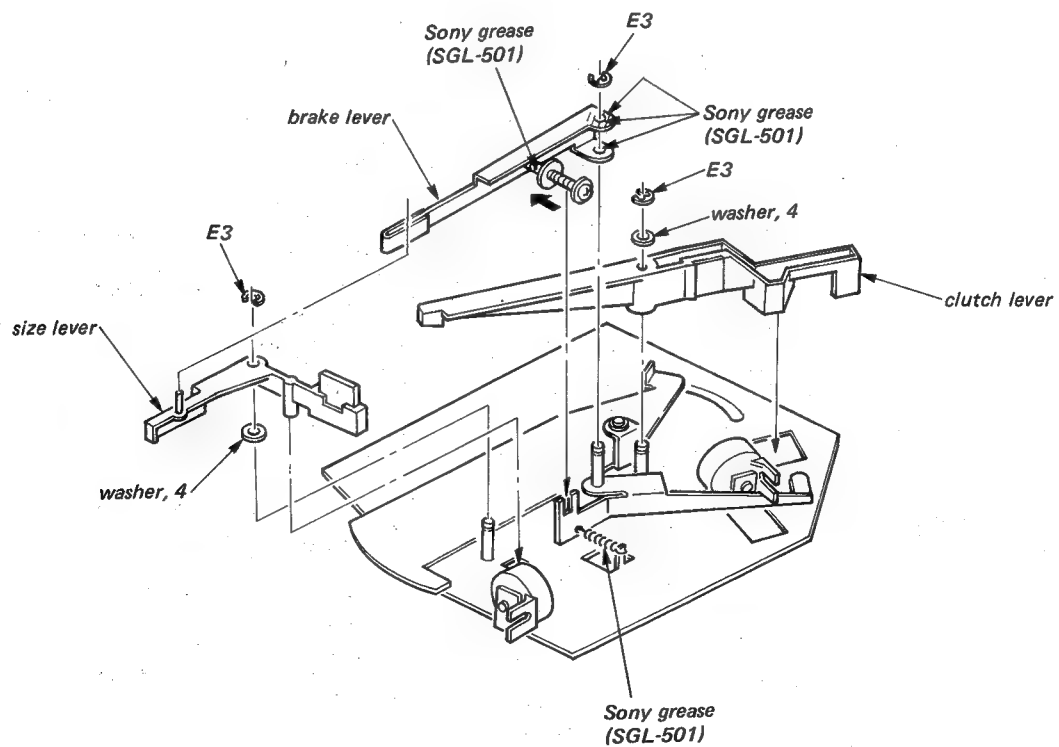


**LIFTER RETAINER**

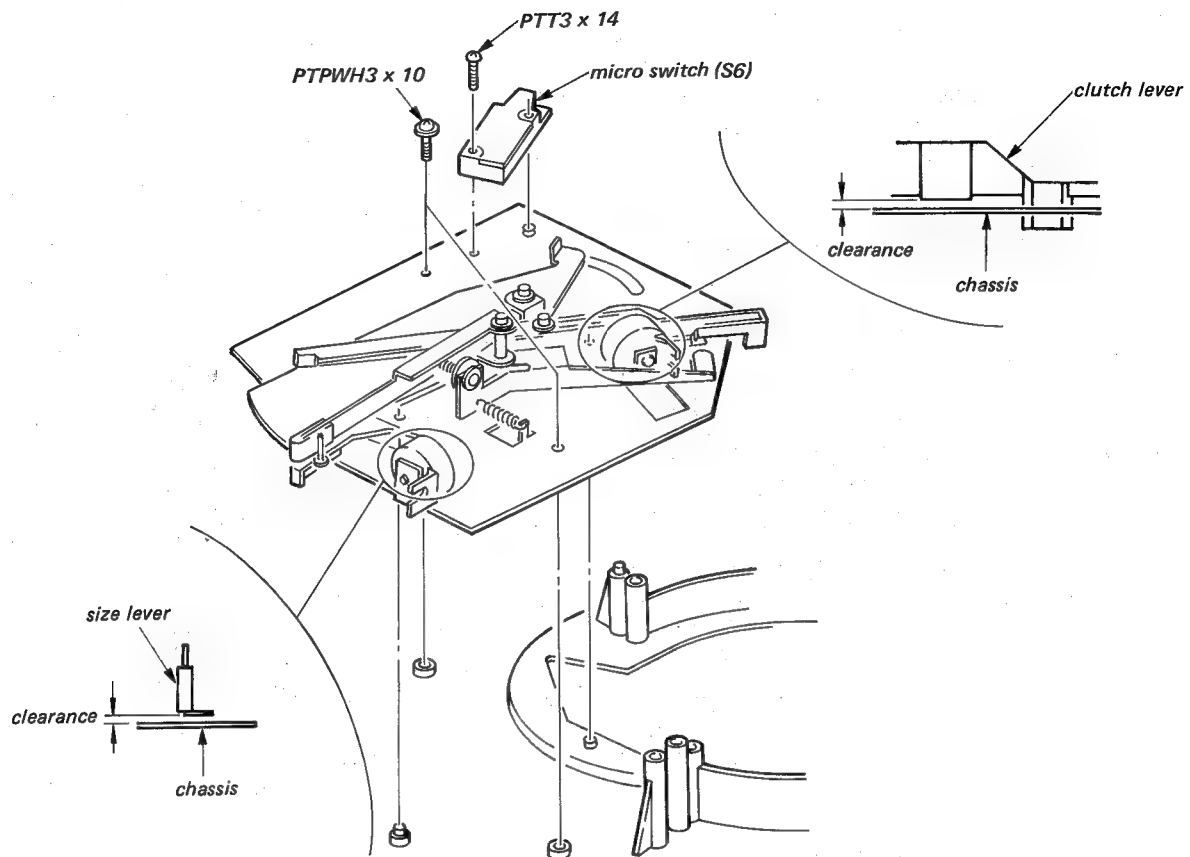


**SIZE LEVER, CLUTCH LEVER, BRAKE LEVER**

If necessary, apply Sony grease (SGL-501) to the specified portion.

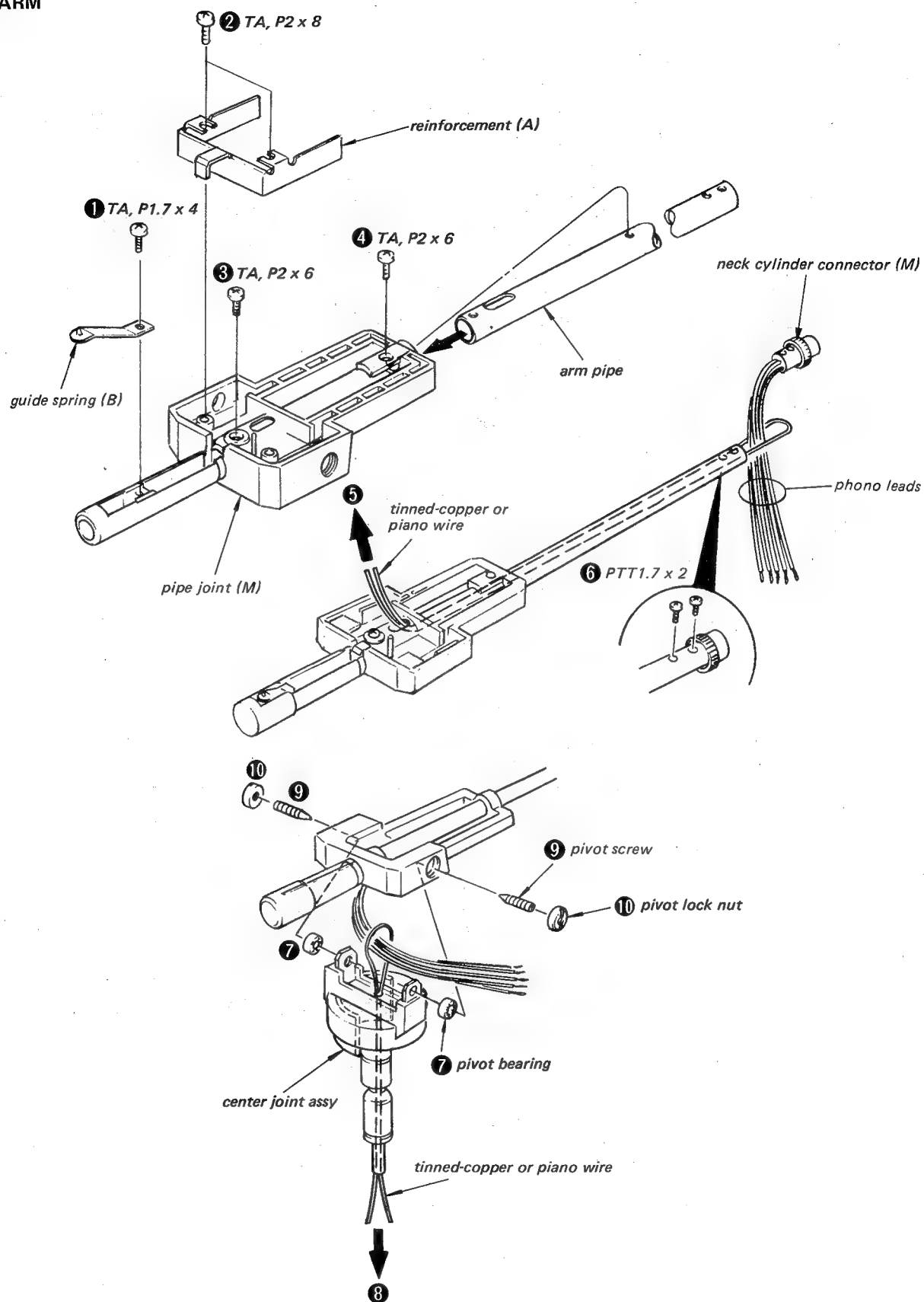


# CHASSIS BLOCK, MICRO SWITCH

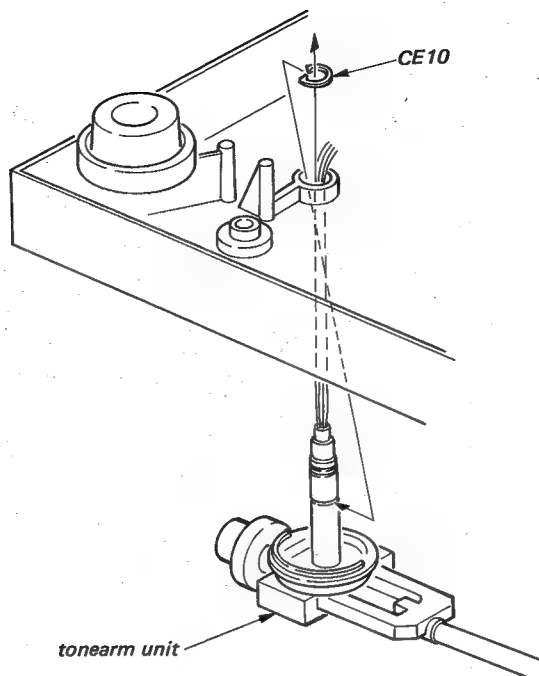


to page 21

**TONEARM**

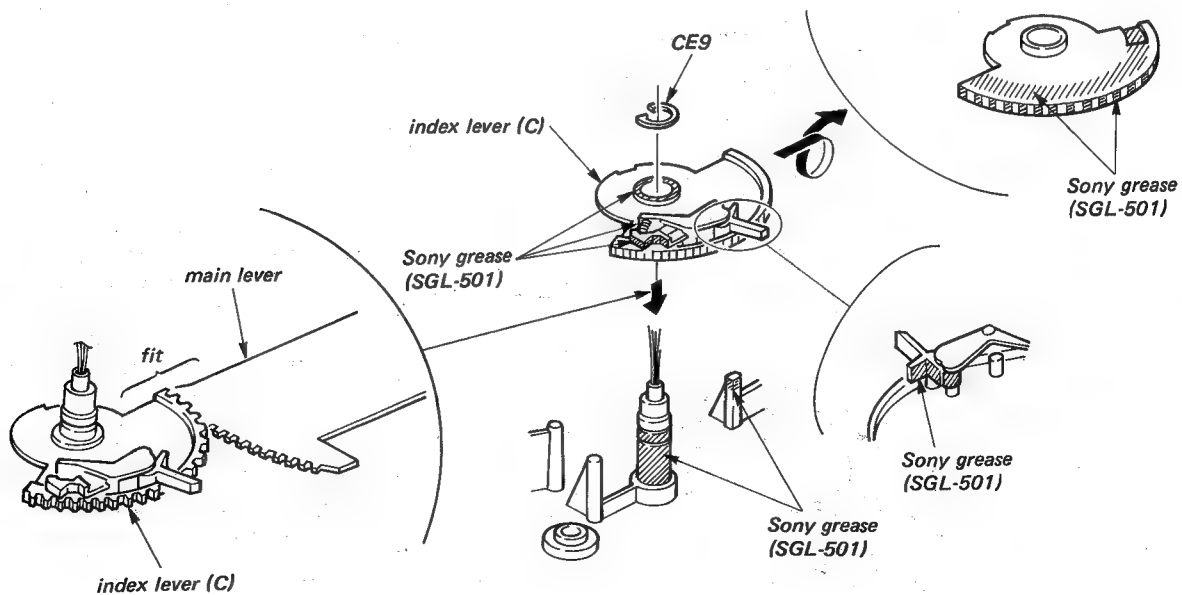


# TONEARM UNIT



## INDEX LEVER (C)

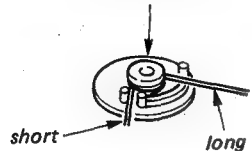
If necessary, apply Sony grease (SGL-501) to the specified portion.



# IFC KNOB (ANTI-SKATING KNOB)

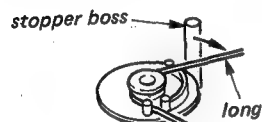
If necessary, apply Sony grease (SGL-501) to the specified portion.

- ④ Install the spring on the IFC cam.



## CAUTION:

Install the spring so that the long side of the spring is located in the portion as shown by the arrow.



- ① Install washer (N) on the IFC knob.



- ⑥ TA, P3 x 25

- ⑤ plain washer 14

IFC spring

stopper boss

IFC cam

Sony grease (SGL-501)

washer (N)

- ③ Fully turn the IFC knob.

# INDEX LEVER (B)

index lever (B)

- ③ CE9

poly-slider

- ②

- ①

index lever (C)

- ④

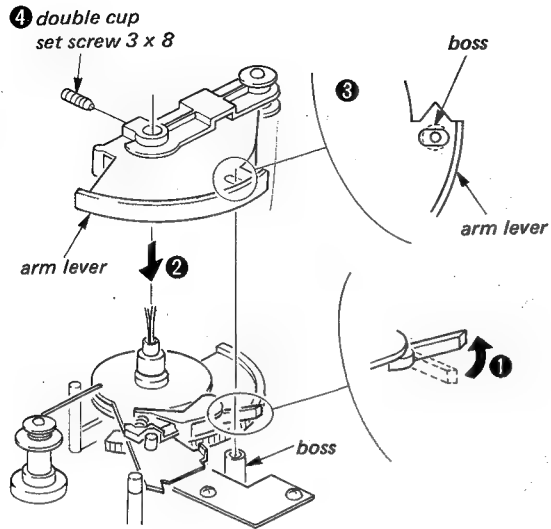
click lever

index lever (B)

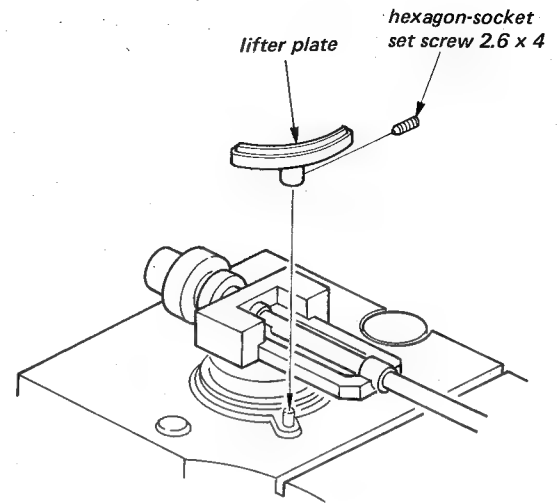
- ⑤ Put the stud A of the index lever (B) into the click lever.



### ARM LEVER

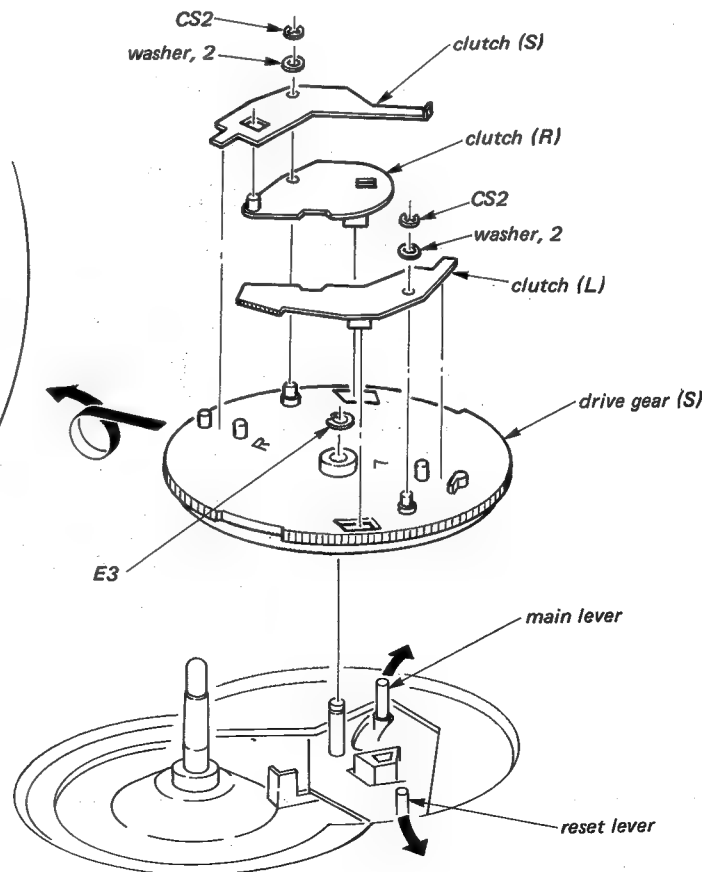
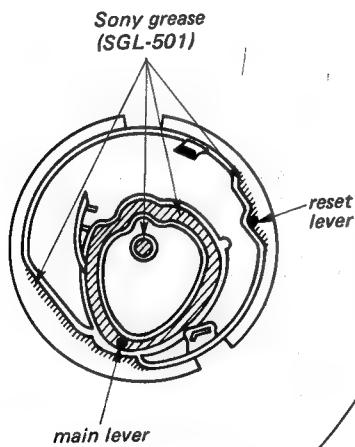


### LIFTER PLATE



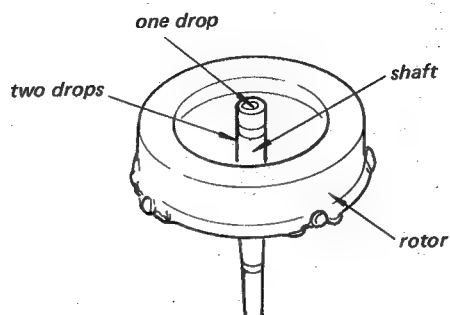
### DRIVE GEAR

If necessary, apply Sony grease (SGL-501) to the specified portion.



**2-3. LUBRICATION**

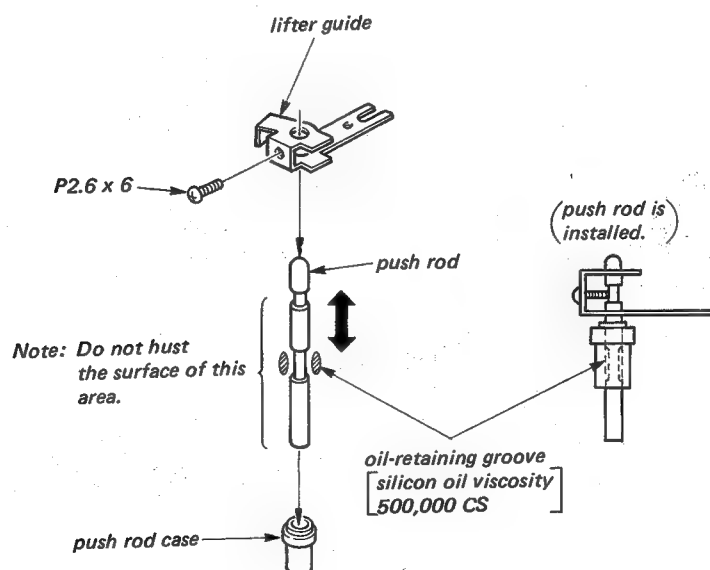
1. When the rotor is replaced, apply Sony oil OL-2KA to the rotor shaft as illustrated below.



2. When the push rod is replaced, apply silicon oil (viscosity: 500,000 cs) to the push rod as illustrated below.

**Caution:**

When lubricating, rotate and move the push rod up and down a few times.



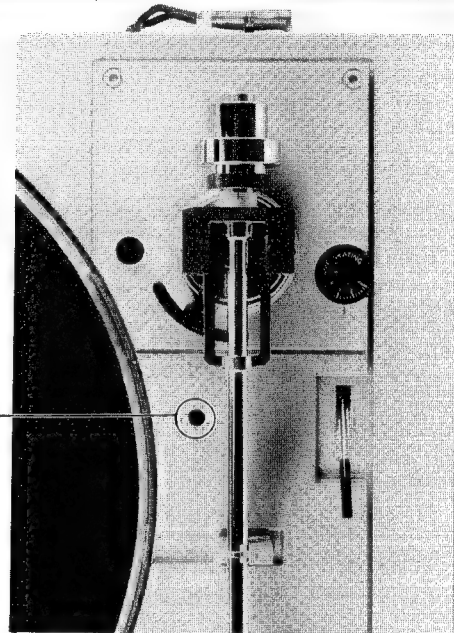
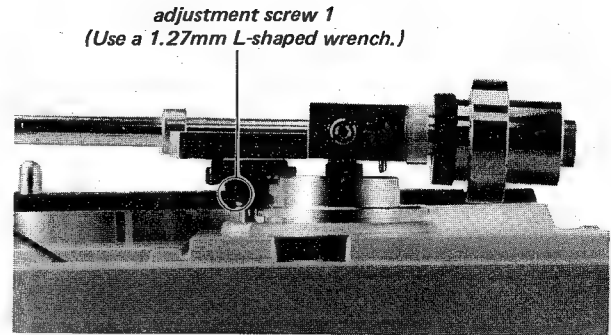
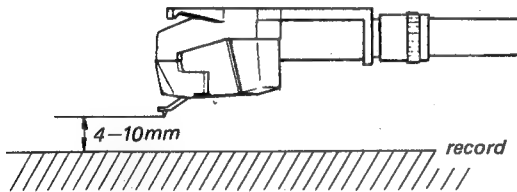
## SECTION 3 ADJUSTMENTS

### 3-1. MECHANICAL ADJUSTMENTS

#### Stylus Height Adjustment

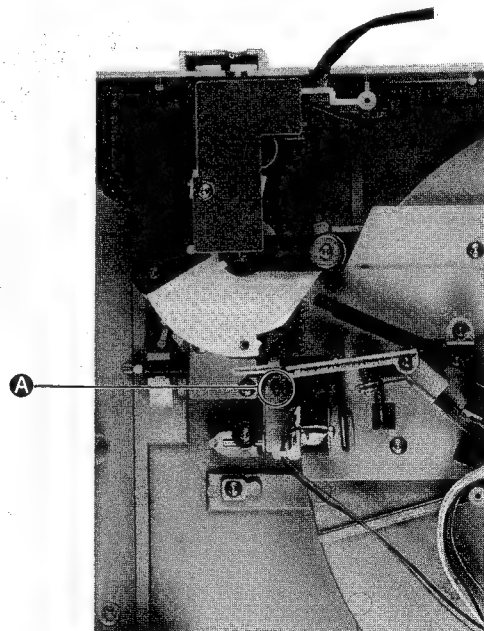
##### At automatic operation

1. Obtain zero balance and apply appropriate stylus force with counterweight. (2g for VL-5 cartridge, 1.8g for XL-150 cartridge)
2. POWER switch: ON
3. Put a record on and press START/STOP switch.
4. Turn the POWER switch OFF when the tonearm reaches the end of the record and the arm lifter rises to perform auto return.
5. At this time, turn the adjustment screw 1 so that the distance between the record surface and the stylus tip is 4 – 10mm.



##### At manual operation

6. Set the lifter lever to "UP" position and push the START/STOP switch.
7. After the tonearm enter the lead-in groove of the record, stop the turntable rotation by turning the POWER switch OFF.
8. Set the lifter lever to "UP" position. Turn the adjustment screw 2 so that the distance between the record surface and the stylus tip is 4 – 10mm.
9. Secure the portion **A** with locking compound.

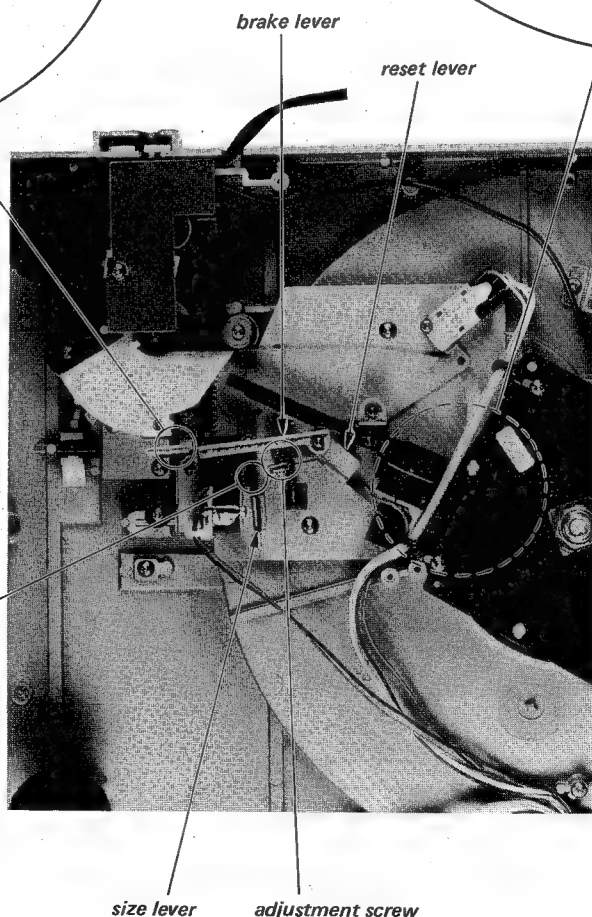
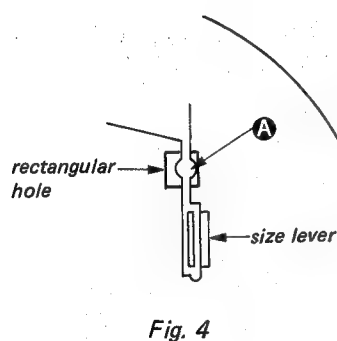
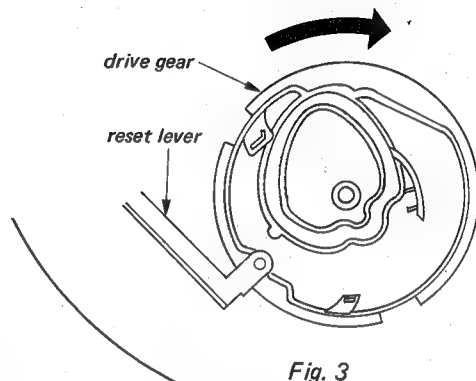
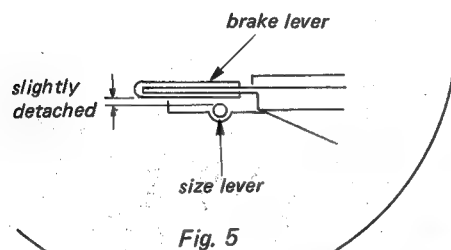


**Brake Lever Position Adjustment**

1. Rotate the drive gear in the direction of the arrow by hand, and set the reset lever to the reset position where the pin of the reset lever is set into the reset groove of the drive gear. See Fig. 3.
2. Confirm that the portion **A** of the size lever lightly touches to rectangular hole of the chassis. See Fig. 4.

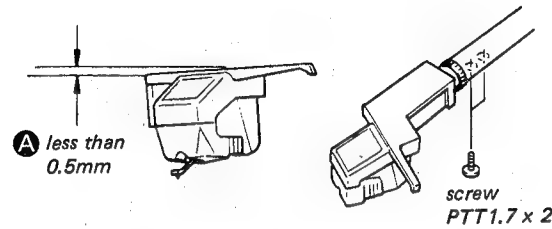
At this time, adjust the adjustment screw so that the brake lever is slightly detached from the size lever. See Fig. 5.

3. Secure the adjustment screw with locking compound.



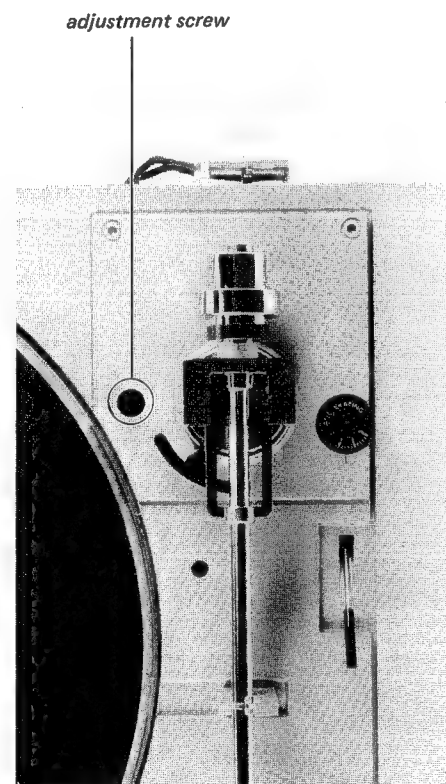
**Shell's Horizontal Balance Adjustment**

Loosen the neck cylinder screw and adjust so that section **A** (shell slant) is less than 0.5mm.

**Stylus Drop-point Adjustment**

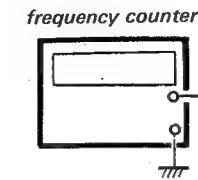
1. Remove the adjustment hole cap.
2. Set stylus force, anti-skating scale.  
(stylus force 2g and anti-skating scale 2 for VL-5 cartridge, stylus force 1.8g and anti-skating scale 1.8 for XL-150 cartridge.)
3. SPEED switch: 33 rpm
4. Use test record YFSC-16. Press START/STOP switch.
5. Turn the adjustment screw so that the stylus tip drops on the record at the 7 – 15 count position.  
clockwise: drop-point moves inward (larger count)  
counterclockwise: drop-point moves outward (lower count)
6. After the adjustment, confirm that the auto-return is started within 3 – 12 count on the test record.

**Note:** The proper adjustment for a 30cm record is also correct for a 17cm record.

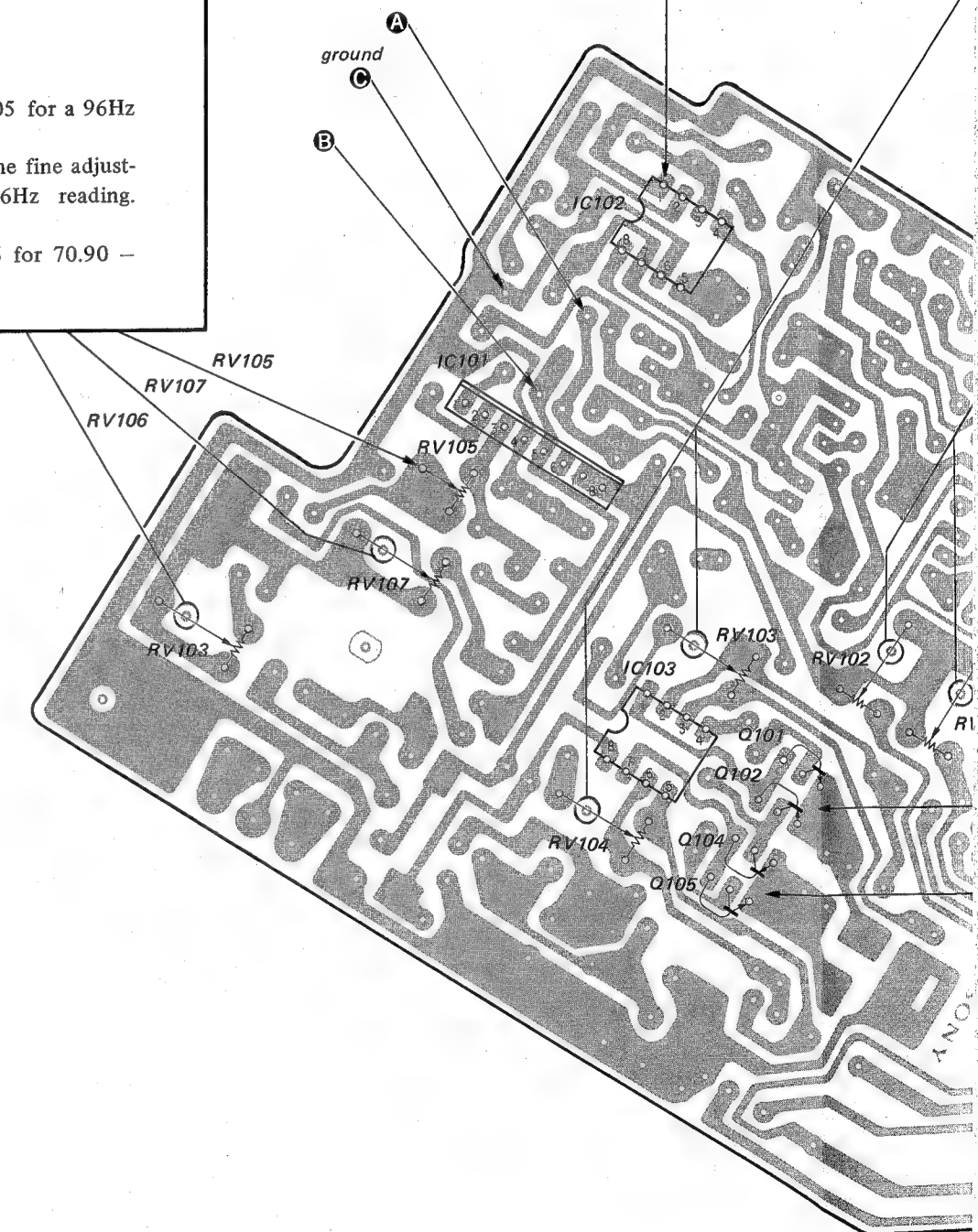
**3-2. ELECTRICAL ADJUSTMENTS****Speed Adjustment**

**Note:** Use a small-blade screwdriver for the adjustments.

1. Connect a frequency counter to pin ① of IC102.
2. Turn the POWER switch ON.



3. Turn the SPEED switch to 45.
4. Adjust the coarse adjustment RV105 for a 96Hz reading on the frequency counter.  
If it is not obtained 96Hz, adjust the fine adjustment RV107 for 95.72 – 96.26Hz reading.
5. Turn the SPEED switch to 33.
6. Adjust the fine adjustment RV106 for 70.90 – 71.32Hz reading.



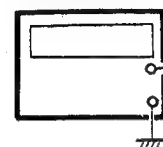
### 3-2. ELECTRICAL ADJUSTMENTS

#### Speed Adjustment

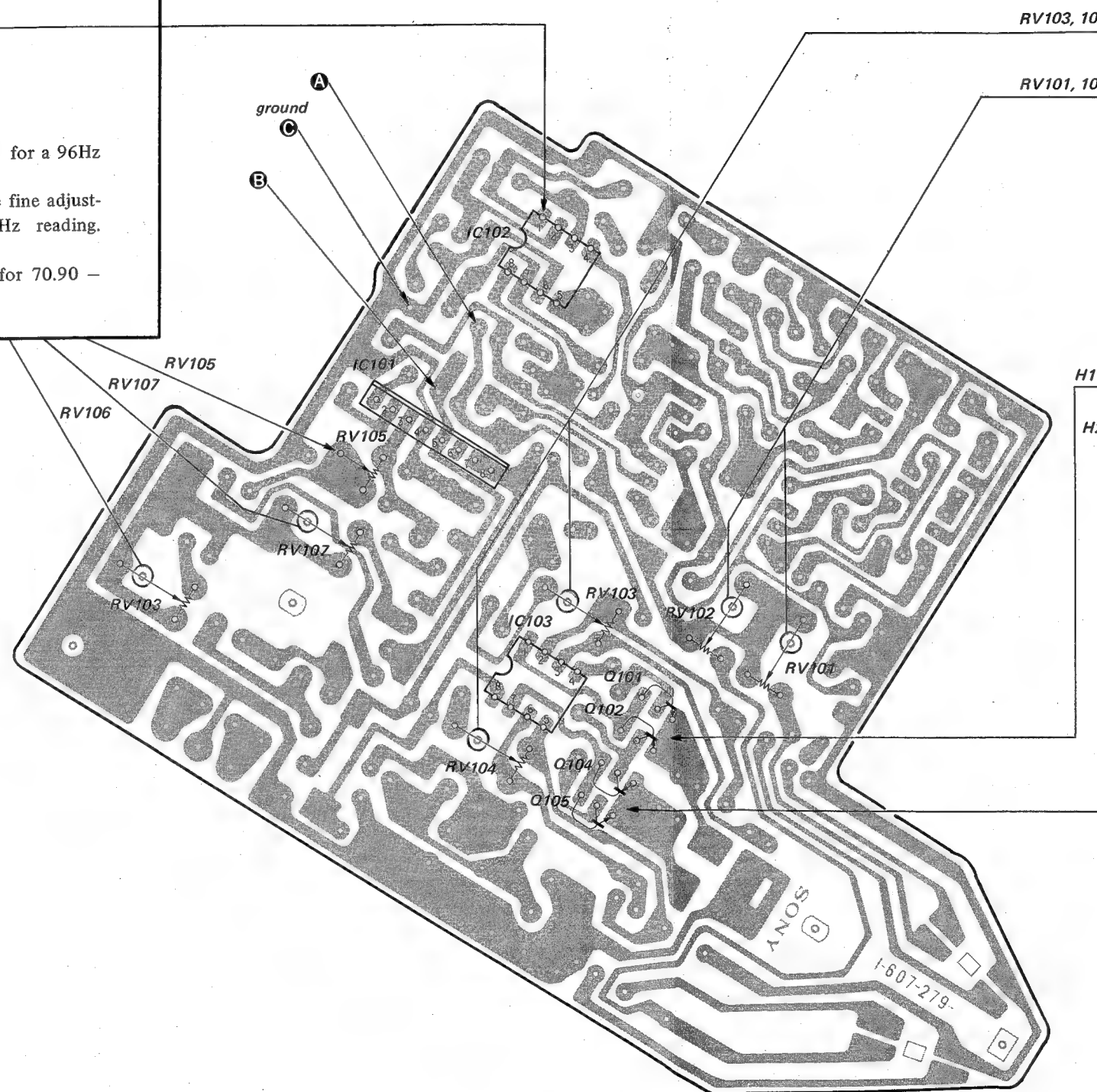
Note: Use a small-blade screwdriver for the adjustments.

1. Connect a frequency counter to pin ① of IC102.
2. Turn the POWER switch ON.

frequency counter



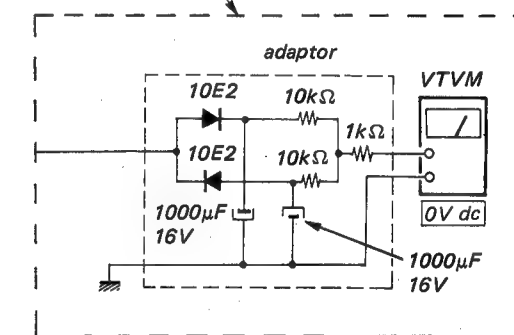
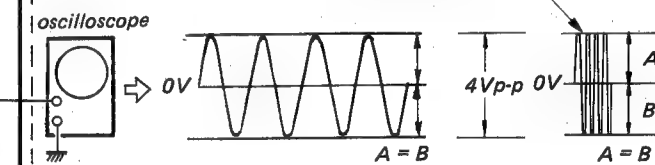
3. Turn the SPEED switch to 45.
4. Adjust the coarse adjustment RV105 for a 96Hz reading on the frequency counter.  
If it is not obtained 96Hz, adjust the fine adjustment RV107 for 95.72 - 96.26Hz reading.
5. Turn the SPEED switch to 33.
6. Adjust the fine adjustment RV106 for 70.90 - 71.32Hz reading.



#### Gain/Offset Adjustments

1. Connect the pattern ② to the pattern ③, and apply a 1V dc to the pattern ①.
2. POWER switch: ON  
SPEED switch: 45
3. Adjust the gain adjustment RV101 at the switch position H1 for a 4Vp-p reading on the oscilloscope.
4. Adjust the gain adjustment RV102 at H2 for a 4Vp-p reading.
5. Adjust the offset adjustment RV103 at H1 for a 0V dc centering on the waveform.
6. Adjust the offset adjustment RV104 at H2 for a 0V dc centering.
7. After the adjustments, disconnect the pattern ② from the pattern ③ and remove the dc-voltage connection from the pattern ①.

Note: Set the sweep time longer for easy waveform checking.





## SECTION 4

### DIAGRAMS

[illegible]

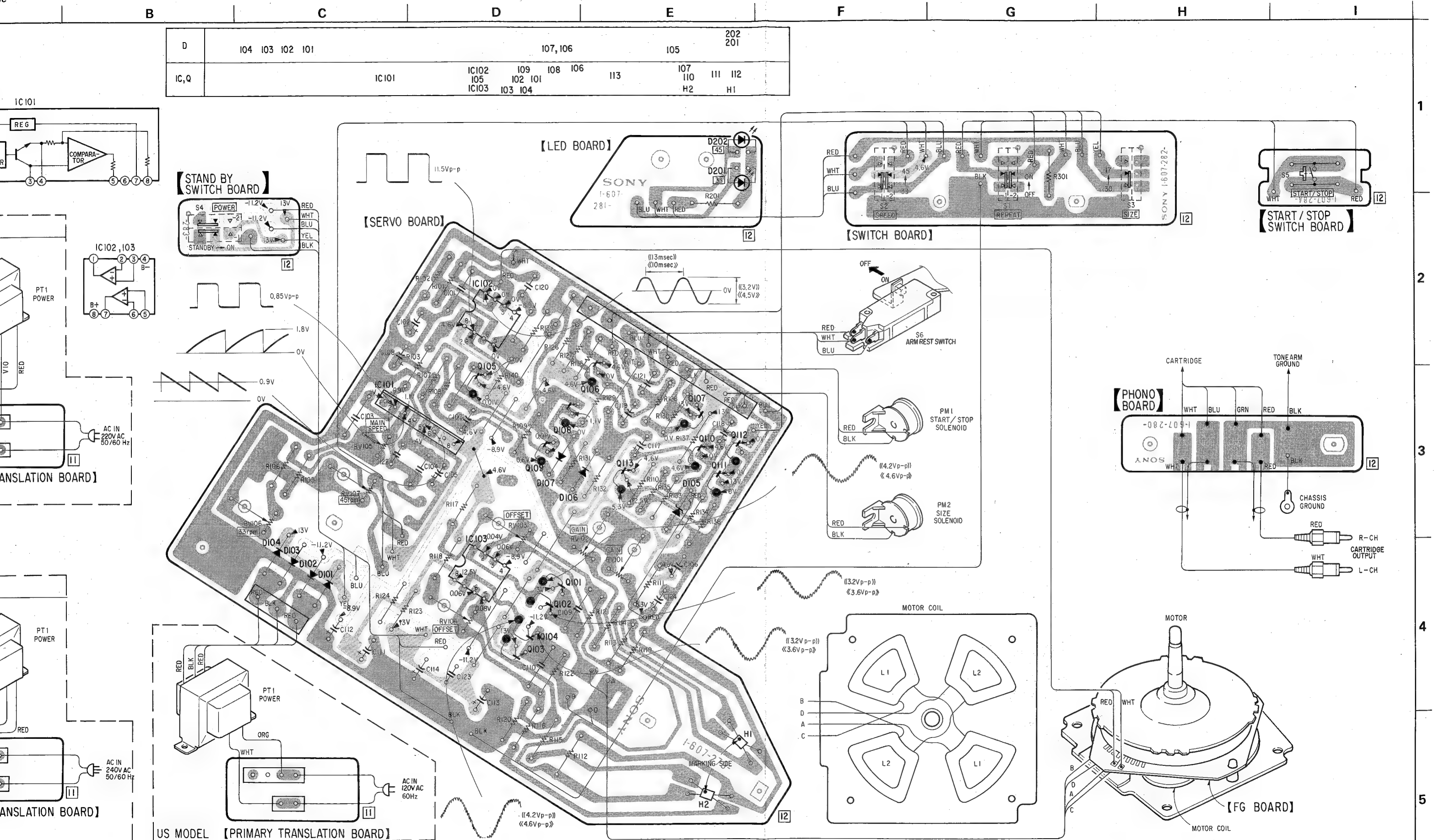
- ○ — : parts extracted from the component side.
- ● — : parts extracted from the conductor side.
- ■■■ : B+ pattern
- ■■■ : B- pattern



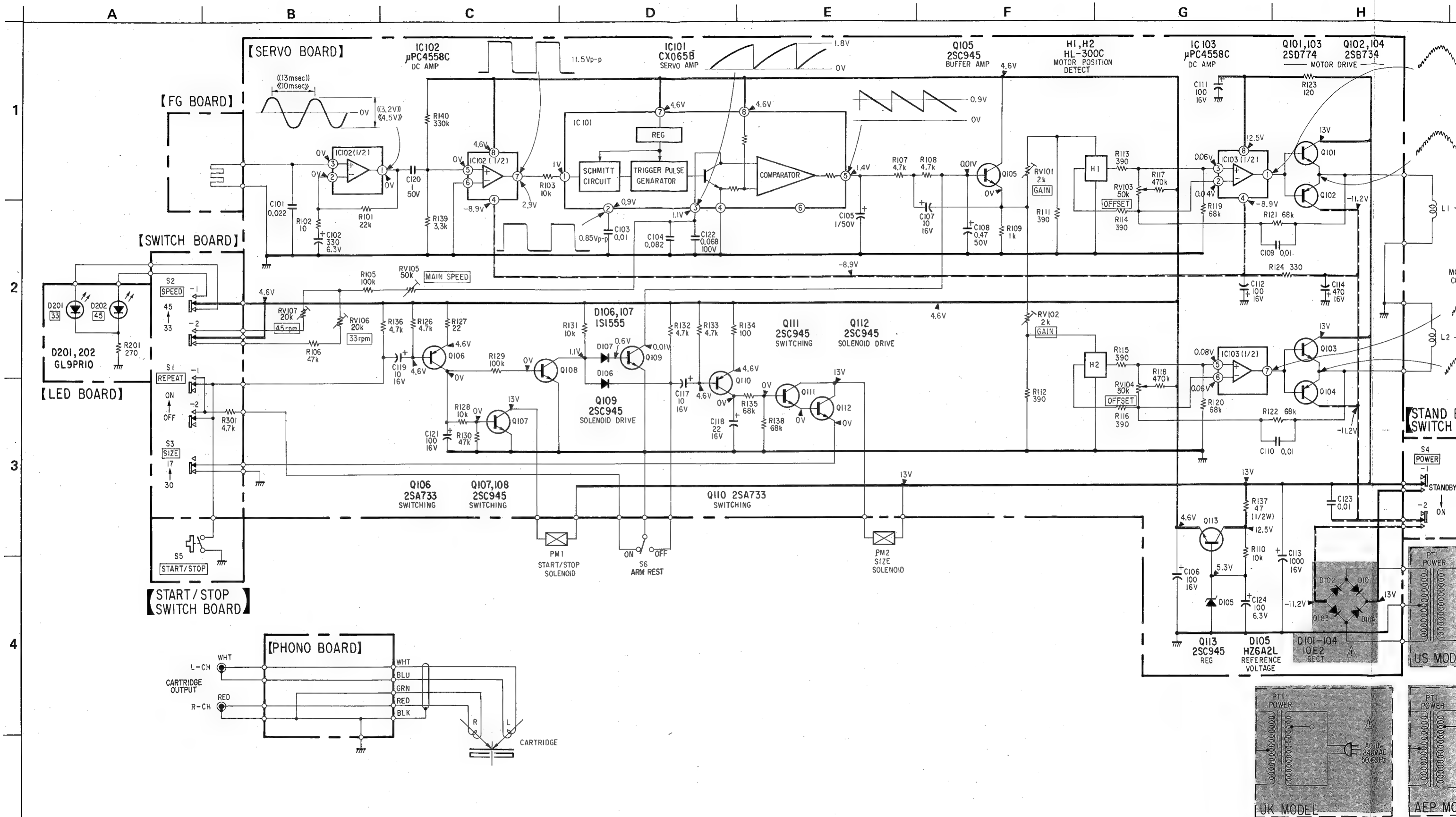
SECTION 4  
DIAGRAMS

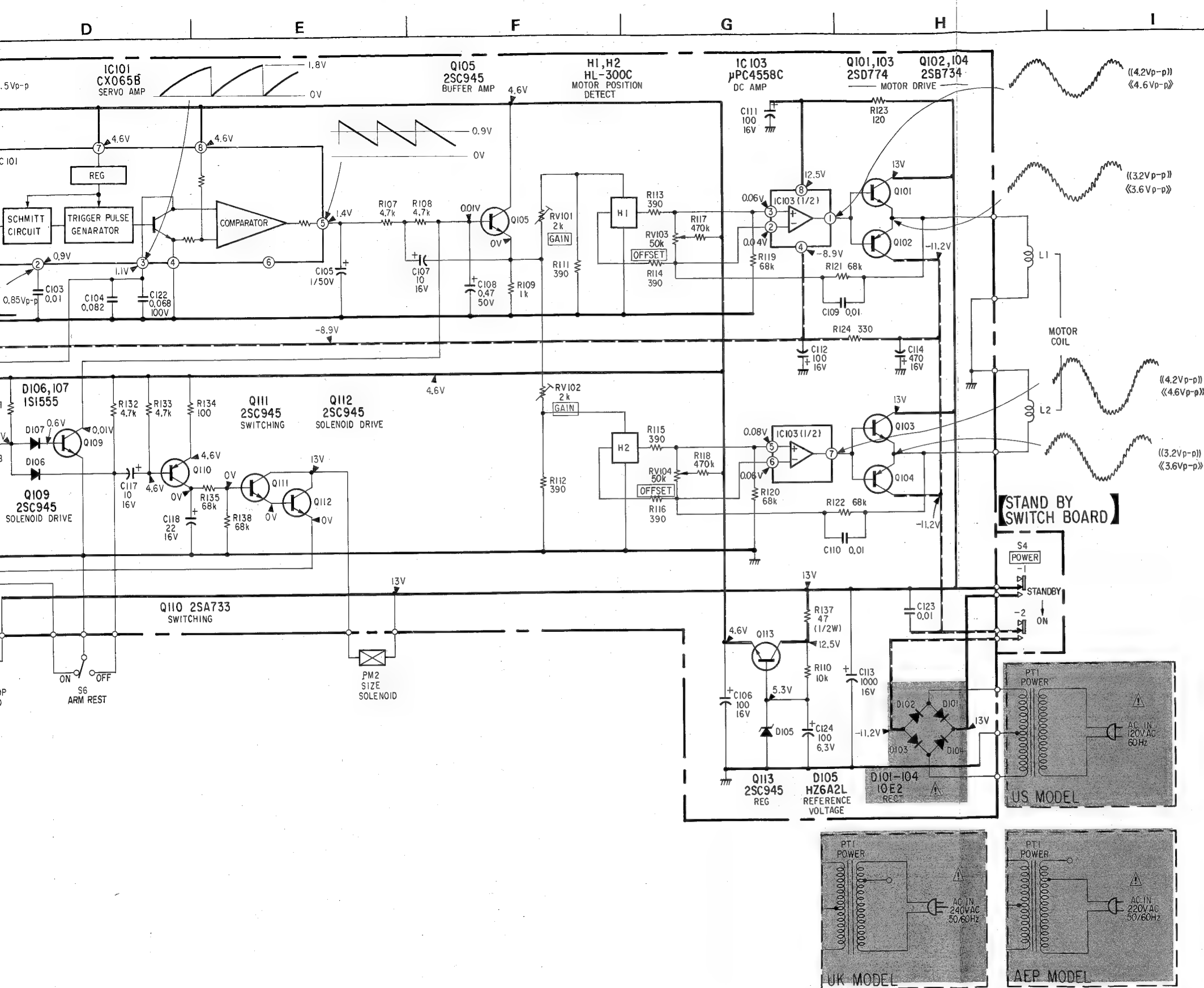
PS-LX33/33B/33C/33(A)


PS-LX33/33B/33C/33(A)




4.2. SCHEMATIC DIAGRAM








Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

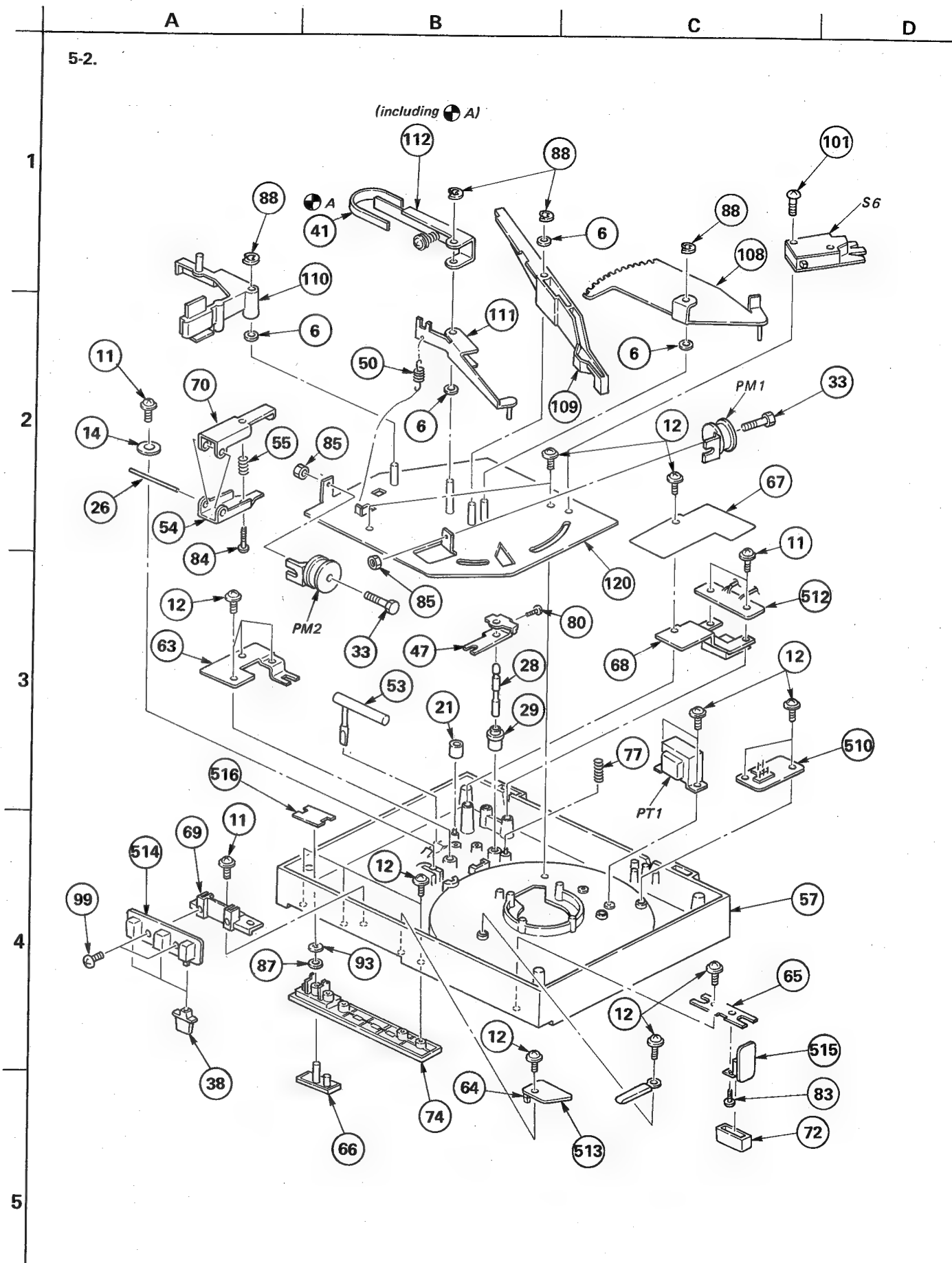
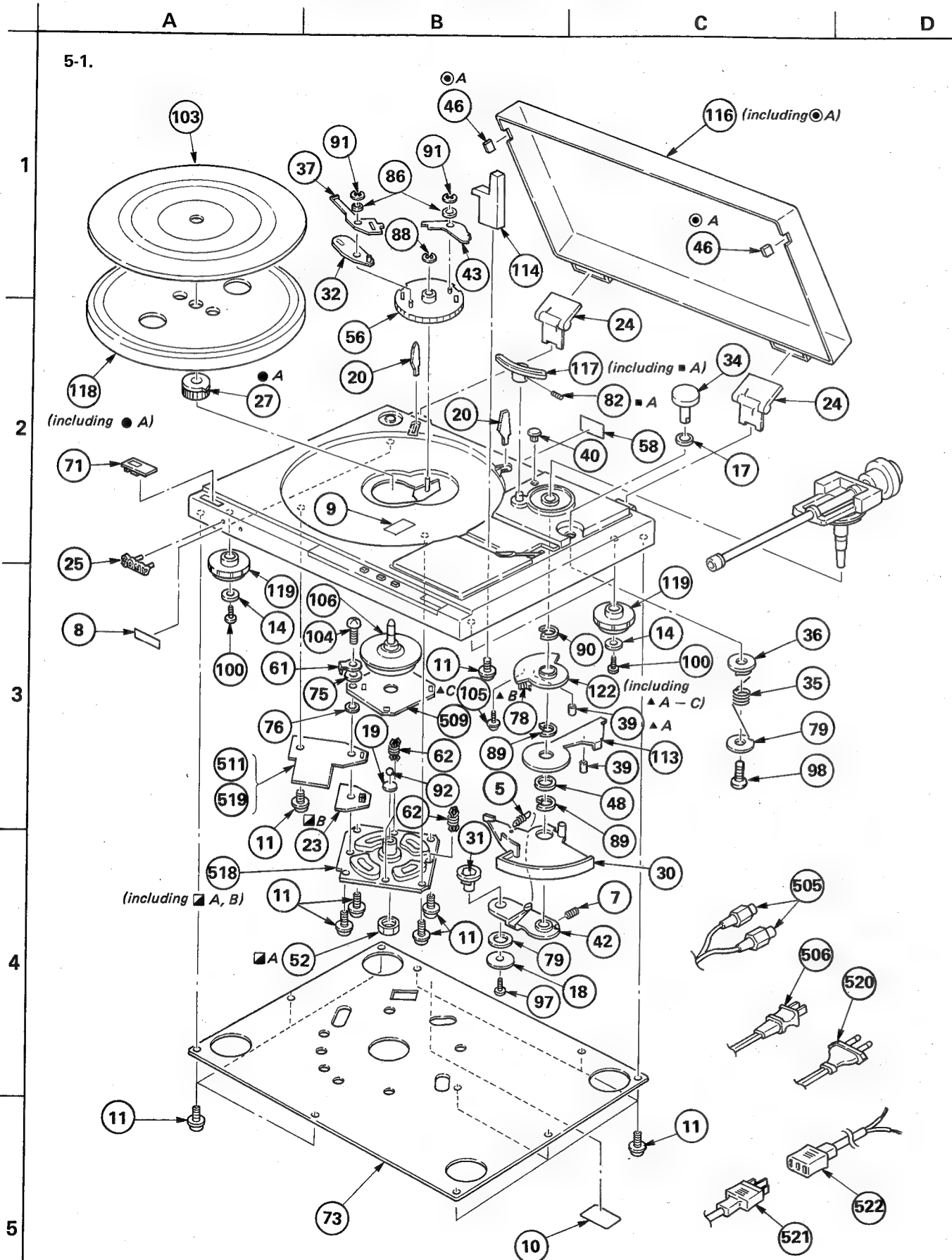
**Note:**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF :  $\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms,  $\frac{1}{4}\text{W}$  unless otherwise noted. k $\Omega$  : 1000  $\Omega$ , M $\Omega$  : 1000 k $\Omega$
-  : adjustment for repair.
-  : B+ bus.
-  : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under POWER switch ON conditions.
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with respect to ground.
- (( )) : 33 rpm
- <> : 45 rpm
- no mark : common

Note: Voltages are measured with a VOM (50k $\Omega$ /V).

## SECTION 5

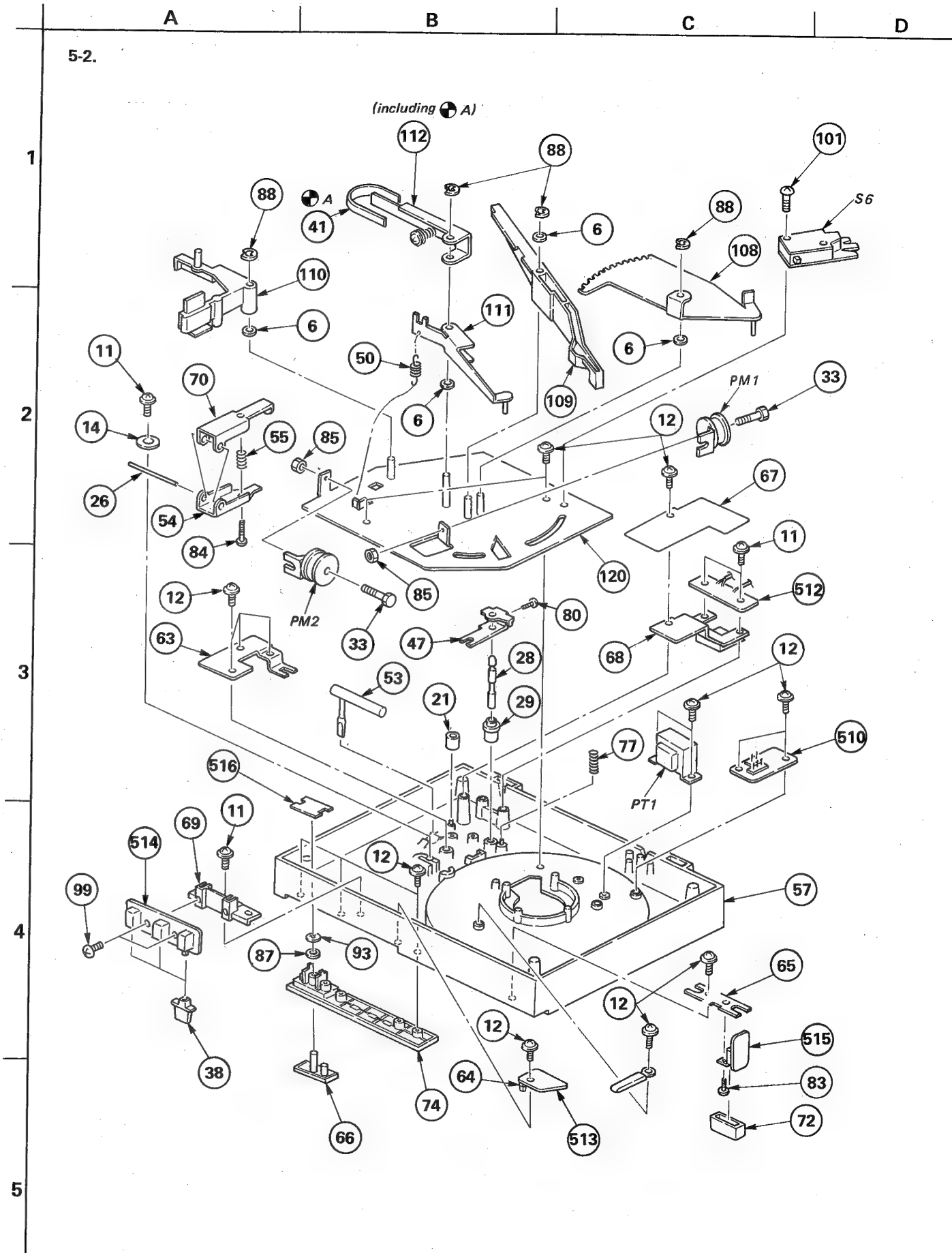
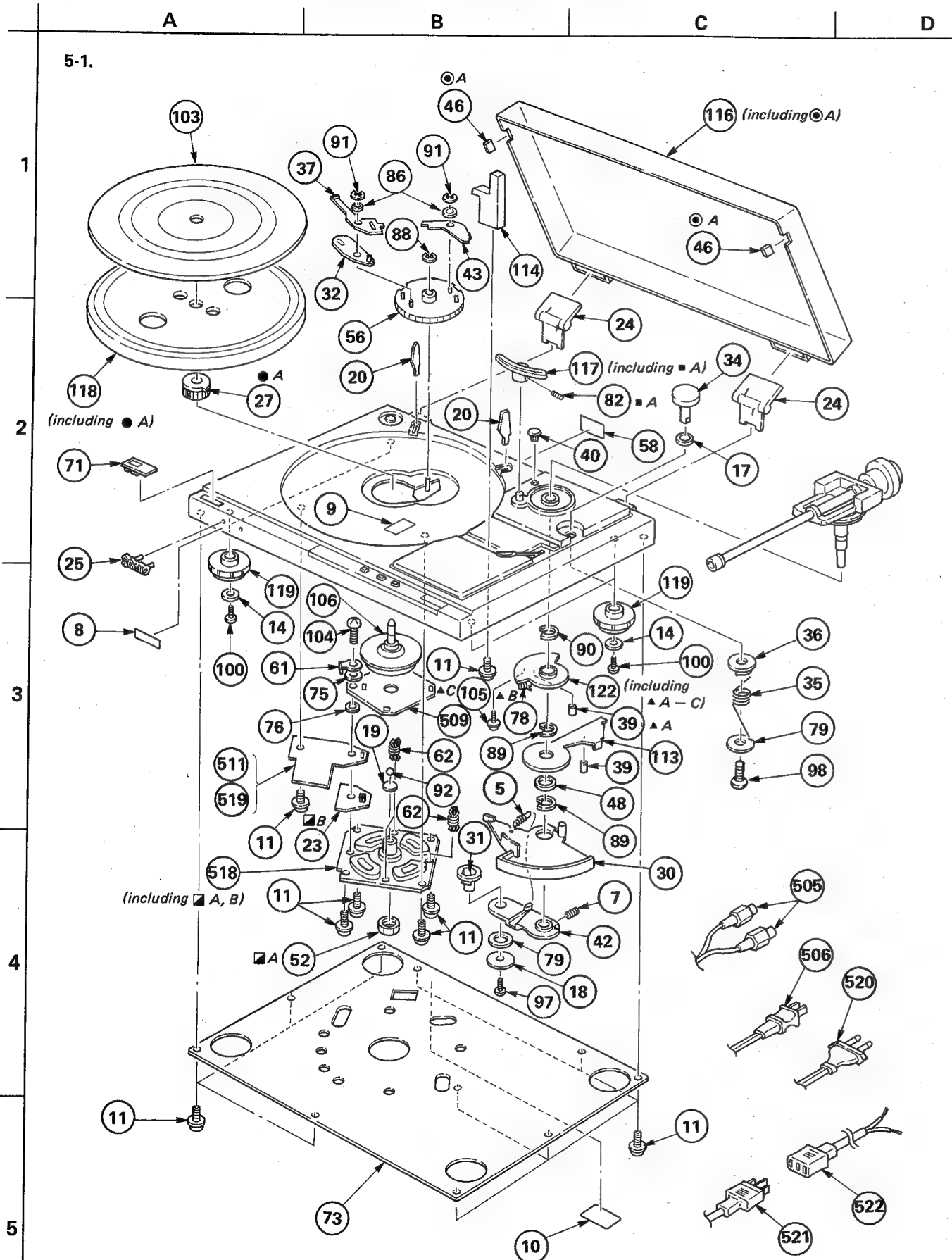
### EXPLODED VIEWS & PARTS LIST



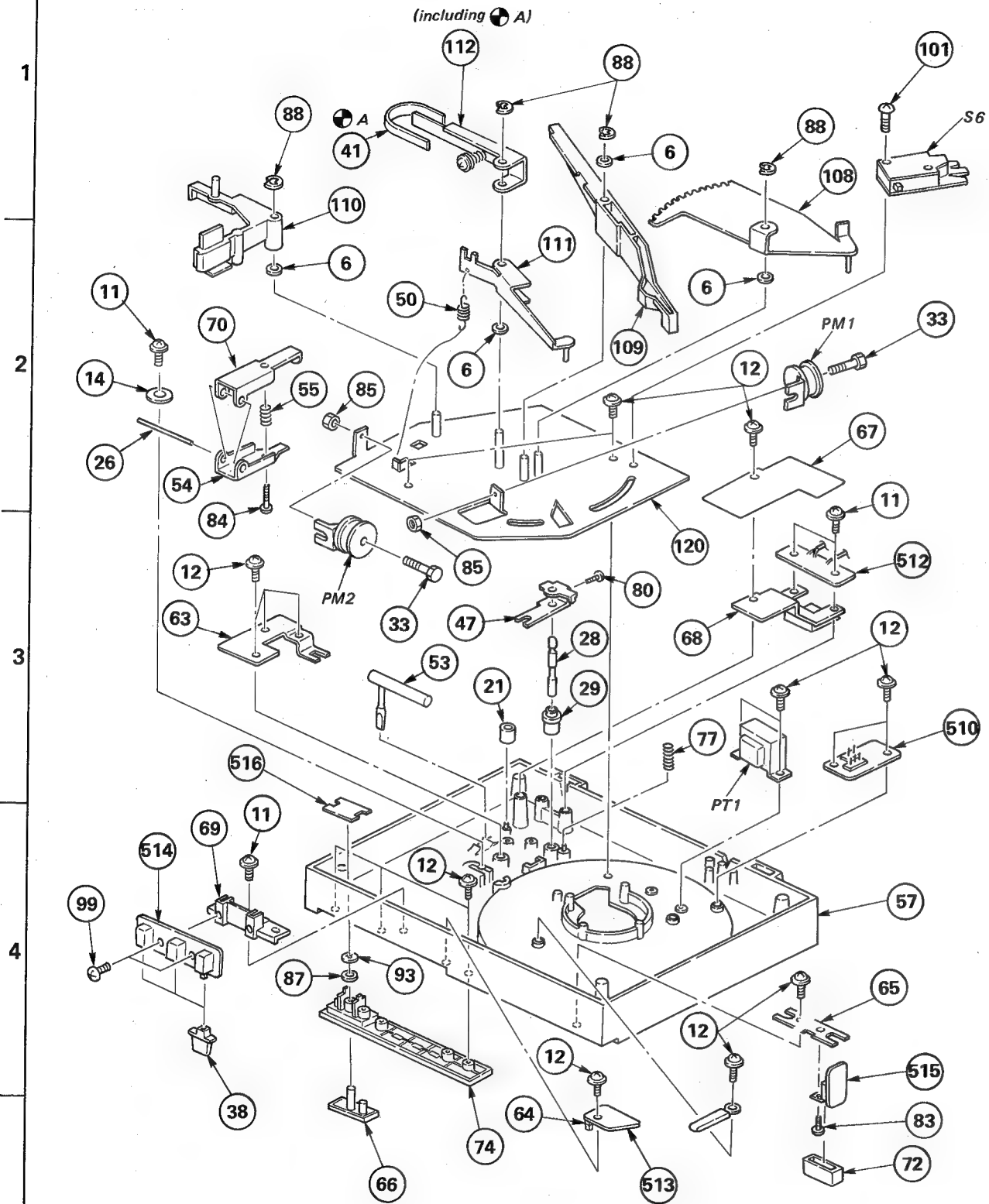


## SECTION 5

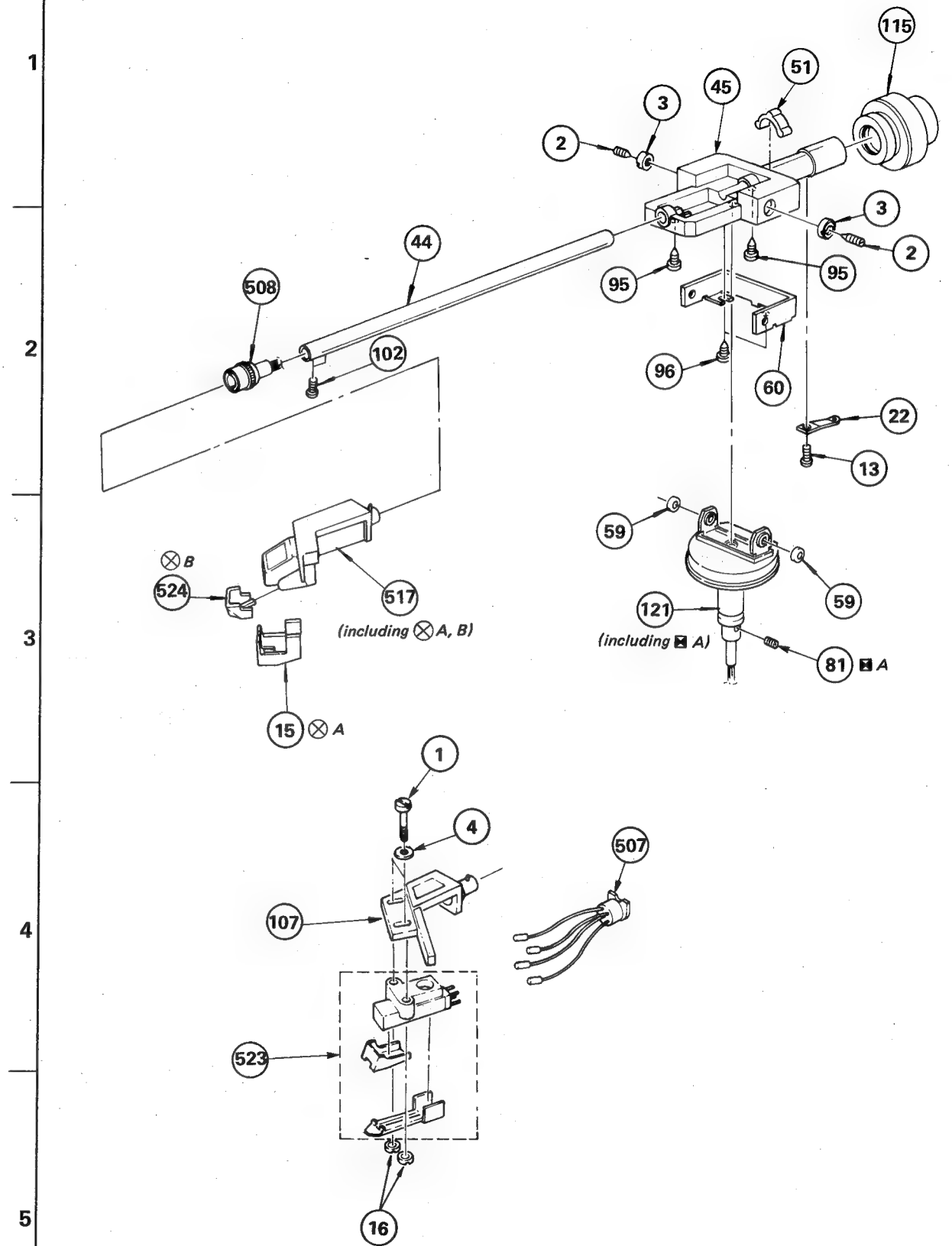
### EXPLODED VIEWS & PARTS LIST



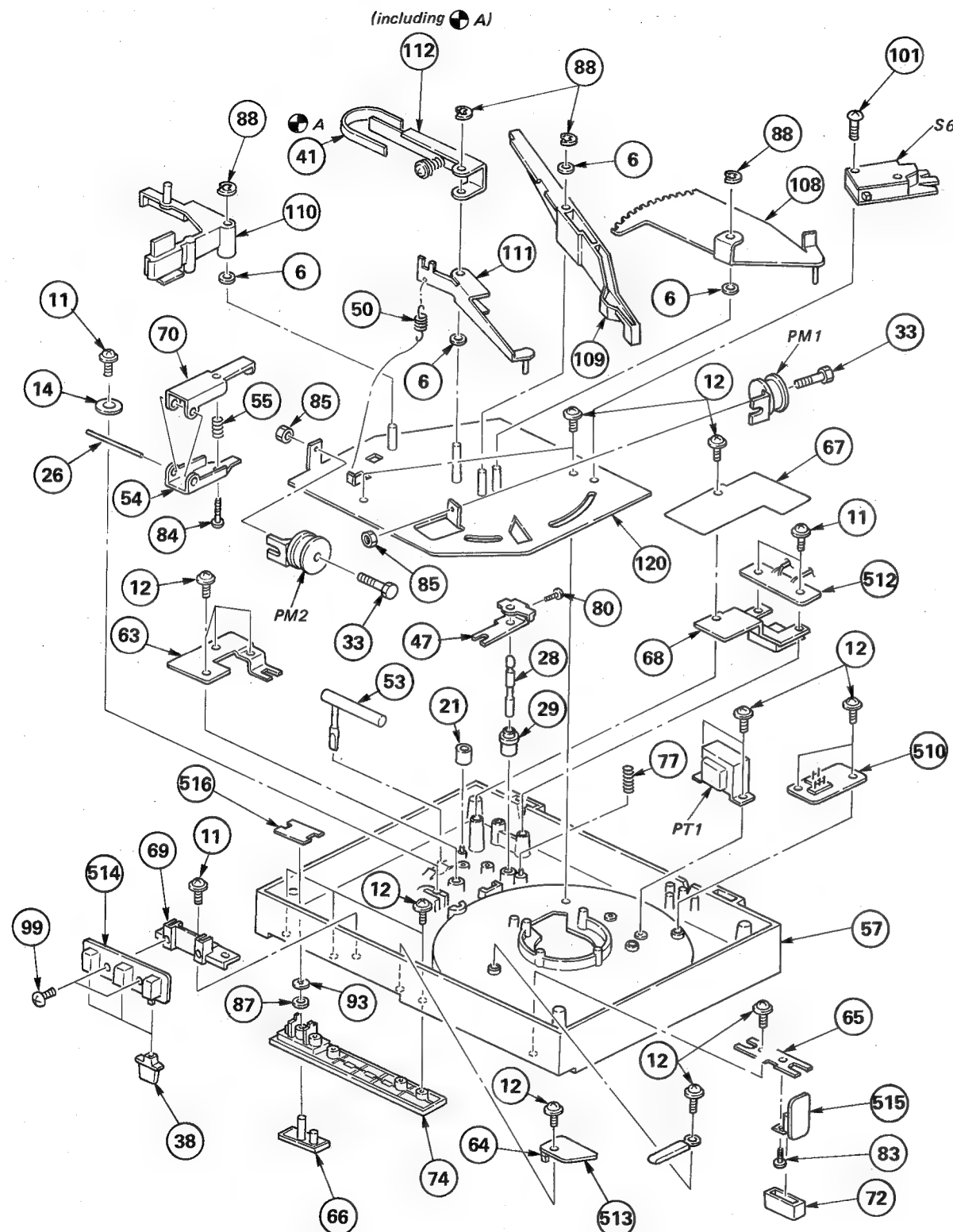
5-2.



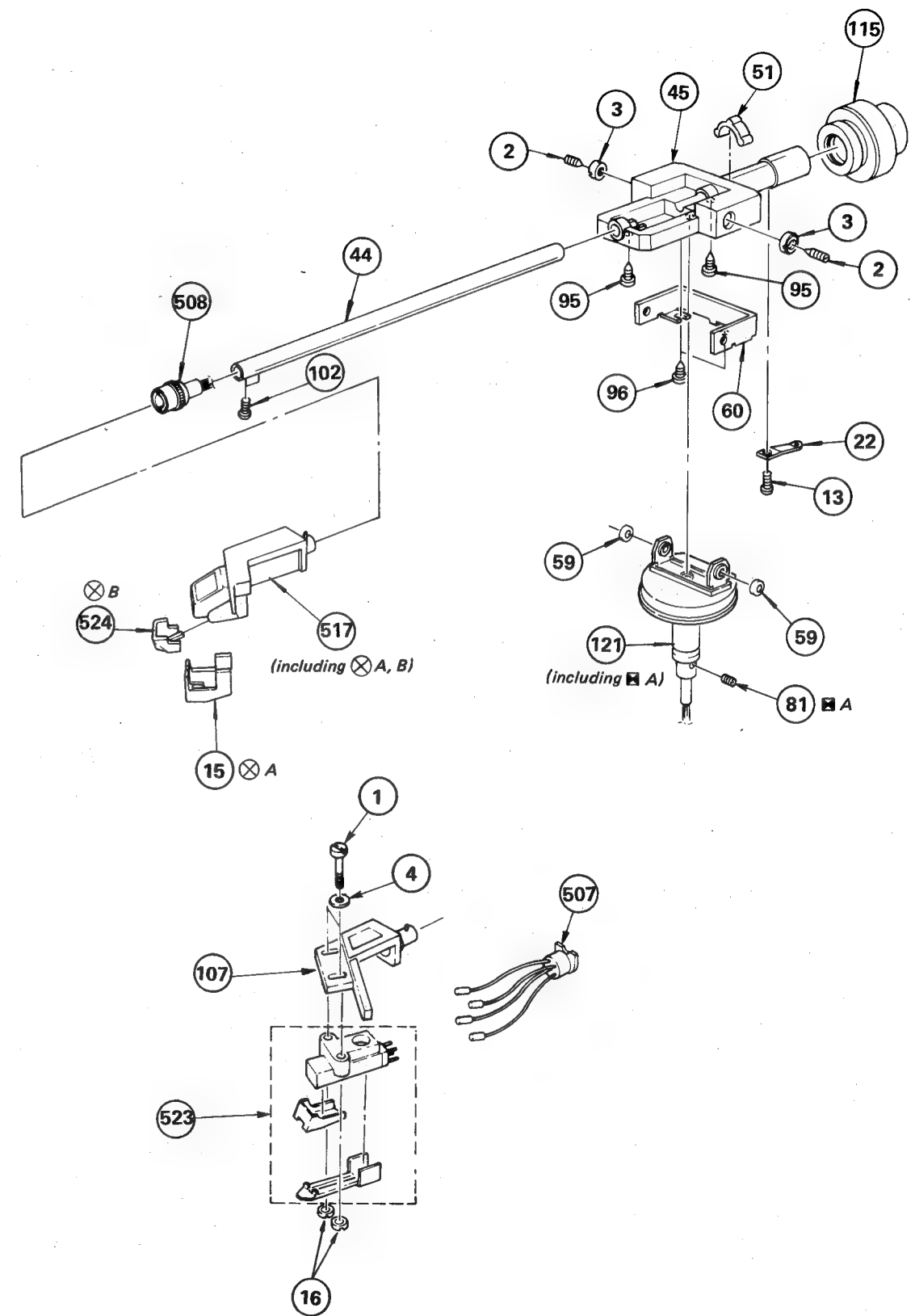
5-3.



5-2.



5-3.





GENERAL SECTION

No.	Part No.	Description
1	2-056-532-00	(LX33C)...SCREW
2	2-203-518-61	SCREW, PIVOT
3	2-203-519-00	NUT (A), LOCK, PIVOT
4	2-229-507-00	(LX33C)...WASHER
5	3-548-124-00	SPRING, TENSION
6	3-701-441-21	WASHER
7	3-701-509-00	SET SCREW, DOUBLE CUP 3X8
8	3-701-690-00	(LX33:UK,LX33(A))...LABEL (MADE IN JAPAN)
9	3-794-123-11	LABEL, CAUTION
10	3-703-043-21	(LX33:UK,LX33C/(A))...LABEL, CAUTION, MAIN
10	4-876-344-00	(LX33/B:AEP)...LABEL, CAUTION, POWER CORD
11	3-703-136-00	SCREW, PTPWH 3X12
12	3-703-137-00	SCREW, PTPWH 3X10
13	3-703-454-00	SCREW, TAPPING
14	4-301-647-00	WASHER, SPECIAL
15	2-331-306-00	(LX33/(A)/B)...COVER, STYLUS
16	4-815-655-01	(LX33C)...NUT
17	4-844-041-00	WASHER, (N)
18	4-844-041-11	WASHER, (N)
19	4-852-007-00	RETAINER (A), THRUST
20	4-874-262-00	GUIDE, RECORD
21	4-852-841-00	TUBE
22	4-853-043-00	SPRING (B), GUIDE
23	4-857-642-00	HOLDER, PC BOARD
24	4-857-653-00	(LX33/C/B)...HINGE, DUST COVER
25	4-857-661-11	EMBLEM, SONY
26	4-861-940-00	SHAFT, LIFTER LEVER
27	4-868-052-00	GEAR, CENTER
28	4-881-688-00	ROD, PUSH
29	4-874-218-00	CASE, PUSH ROD
30	4-874-223-00	LEVER (A), ARM
31	4-874-231-00	CAM, ECCENTRIC
32	4-874-232-00	CLUTCH (R)
33	4-874-234-00	CORE
34	4-874-247-00	KNOB, IFC
35	4-874-250-00	SPRING
36	4-874-252-00	CAM, IFC
37	4-874-254-00	CLUTCH (S)
38	4-874-257-11	KNOB (A)
39	4-874-259-00	RUBBER, SHOCK ABSORBING
40	4-874-260-01	(LX33/C/(A))...CAP, BLIND
40	4-874-260-11	(LX33B)...CAP, BLIND
41	4-874-275-00	PAD, BRAKE
42	4-874-277-00	LEVER (B), ARM
43	4-874-279-00	CLUTCH (L)

GENERAL SECTION

No.	Part No.	Description
44	4-875-210-00	PIPE, ARM
45	4-875-218-00	JOINT (M), PIPE
46	4-876-304-00	(LX33/C/B)...CUSHION, DUST COVER
47	4-876-317-00	GUIDE, LIFTER
48	4-876-324-21	POLY-SLIDER (DIA. 9.5)
49	.....	.....
50	4-876-346-00	SPRING, TENSION (RESET)
51	4-876-348-00	(LX33/(A)/B)...GUIDE, STYLUS PRESSURE SETTING
52	4-881-687-00	NUT (M12), SERRATION
53	4-877-824-00	CAM, LIFTER
54	4-880-501-00	LEVER (A), LIFTER
55	4-880-503-00	SPRING, COMPRESSION
56	4-880-524-00	GEAR (S), DRIVE
57	4-881-602-02	(LX33/C/(A))...FRAME
57	4-881-602-11	(LX33B)...FRAME
58	4-881-604-00	(LX33C)...LABEL, MODEL NUMBER
58	4-881-605-00	(LX33:AEP)...LABEL, MODEL NUMBER
58	4-881-606-00	(LX33:UK,LX33(A))...LABEL, MODEL NUMBER
58	4-881-692-00	(LX33B)...LABEL, MODEL NUMBER
59	4-881-618-00	BEARING, PIVOT
60	4-881-628-00	REINFORCEMENT (A)
61	4-881-629-00	PLATE (A), GROUND
62	4-881-636-00	SUPPORT (TMD), PC
63	4-881-652-00	RETAINER (B), LIFTER
64	4-881-653-00	SPACER, LED
65	4-881-654-00	BRACKET, SWITCH
66	4-881-655-00	KNOB, START
67	4-881-656-00	PLATE (UPPER), SHIELD
68	4-881-657-00	PLATE (LOWER), SHIELD
69	4-881-658-00	HOLDER, SWITCH
70	4-881-659-00	LEVER (C), LIFTER
71	4-881-660-01	(LX33C)...ESCUTCHEON, POWER
71	4-881-660-11	(LX33/(A))...ESCUTCHEON, POWER
71	4-881-660-31	(LX33B)...ESCUTCHEON, POWER
72	4-881-662-00	(LX33/C/(A))...KNOB, POWER
72	4-881-662-11	(LX33B)...KNOB, POWER
73	4-881-663-00	BOARD, BOTTOM
74	4-881-664-00	(LX33/C/(A))...PANEL, CONTROL
74	4-881-664-11	(LX33B)...PANEL, CONTROL
75	4-881-665-00	COLLAR (TMD)
76	4-881-666-00	WASHER (FG)
77	4-881-675-00	SPRING, COMPRESSION (LIFTER)
78	4-881-676-00	SPRING (CLICK), COMPRESSION
79	0-056-028-00	WASHER, PLAIN, 14 DIA.
80	7-621-259-45	SCREW +P 2.6X6

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "●" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.


RESISTORS


- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SEMICONDUCTORS

In each case, U : μ, for example:  
UA.... : μA...., UPA.... : μPA...., UPC.... : μPC,  
UPD.... : μPD....

## GENERAL SECTION

No.	Part No.	Description
81	7-621-712-17	SET-SCREW, SLOT 2.6X2 CUP POINT
82	7-621-738-08	SET-SCT, HEX. 2.6X4, FLAT POINT
83	7-621-770-87	SCREW +P 2.6X5
84	7-621-775-80	SCREW +B 2.6X16
85	7-622-207-05	N 2.6, TYPE 2
86	7-623-105-15	W 2, MIDDLE
87	7-623-925-11	WASHER 4.0, NYLON
88	7-624-106-04	STOP RING 3.0, TYPE -E
89	7-624-133-44	STOP RING 9, TYPE-CE
90	7-624-133-54	STOP RING 10, TYPE-CE
91	7-624-190-81	STOP RING 2, TYPE-CS
92	7-671-114-01	BALL 4, STEEL
93	7-624-190-31	STOP RING 4, TYPE-CS
94	.....	
95	7-685-104-64	SCREW +P 2X6 TYPE4
96	7-685-105-24	SCREW +P 2X8 TYPE2 SLIT
97	7-685-145-21	SCREW +P 3X6 TYPE2 SLIT
98	7-685-152-21	SCREW +P 3X25 TYPE2 SLIT
99	7-685-646-21	SCREW +BVTP 3X8 TYPE2 SLIT
100	7-685-651-21	SCREW +BVTP 3X20 TYPE1
101	7-685-755-01	SCREW +PTT 3X14 (S)
102	7-685-772-04	SCREW +PTT 1.7X2, TYPE1
103	4-877-807-01	(LX33/(A)/B)...SHEET, TURNTABLE
103	4-877-807-11	(LX33C).....SHEET, TURNTABLE
104	7-682-149-13	SCREW +P 3X10
105	7-687-202-21	TOTSU PTPWH 2X4, TYPE 2, SLIT
106	A-4608-213-A	ROTOR ASSY
107	X-4869-912-2	(LX33C)...SHELL ASSY, HEAD
108	•;X-4874-202-0	LEVER ASSY, MAIN
109	X-4874-203-0	LEVER ASSY, CLUTCH
110	•;X-4874-204-0	LEVER ASSY, SIZE
111	•;X-4874-205-0	LEVER ASSY, RESET
112	•;X-4874-206-0	LEVER ASSY, BRAKE
113	•;X-4874-209-0	LEVER (B) ASSY, INDEX
114	X-4874-212-1	(LX33/C/(A))...REST ASSY, ARM
114	X-4874-212-X	(LX33B).....REST ASSY, ARM
115	X-4874-214-0	WEIGHT ASSY, MAIN
116	X-4877-804-0	(LX33/C/B)...COVER ASSY, DUST
117	X-4880-501-0	PLATE ASSY, LIFTER
118	X-4881-603-0	TURNTABLE ASSY
119	X-4881-607-0	INSULATOR ASSY
120	•;X-4881-608-0	CHASSIS ASSY
121	X-4881-611-0	JOINT ASSY, CENTER
122	X-4881-610-0	LEVER (C) ASSY, INDEX

### NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "•" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

### CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers.
- MF:μF, PF:μμF.

### RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.


- F: nonflammable


### COILS

- MMH: mH, UH: μH

## ACCESSORY & PACKING MATERIAL

Part No.	Description
3-701-613-00	BAG, POLYETHYLENE, FOR RECORD GUIDE
3-701-616-00	BAG, POLYETHYLENE, FOR MAIN WEIGHT, CARTRIDGE
3-701-630-00	BAG, POLYETHYLENE, FOR INSTRUCTION MANUAL
3-701-634-00	BAG, POLYETHYLENE, FOR TURNTABLE
3-701-806-00	ADAPTOR, 45
3-703-450-02	(LX33C)...INSTRUCTION
3-773-032-11	(LX33/(A))...MANUAL, INSTRUCTION
3-773-032-21	(LX33C).....MANUAL, INSTRUCTION
3-773-032-41	(LX33:AEP)...MANUAL, INSTRUCTION
3-773-262-11	(LX33B).....MANUAL, INSTRUCTION
3-773-262-41	(LX33B).....MANUAL, INSTRUCTION
4-862-043-00	CUSHION, ARM
4-862-680-00	(LX33/C/B)...PROTECTOR
4-876-320-00	SPACER, CLUTCH
4-876-352-00	(LX33/C/B)...SHEET, PROTECTION, FOR SET
4-879-798-00	(LX33(A))....SHEET, PROTECTION, FOR SET
4-881-668-00	HOLDER, TURNTABLE
4-881-669-00	(LX33/C/B)...CUSHION, LEFT
4-881-670-00	(LX33/C/B)...CUSHION, RIGHT
4-881-671-00	CUSHION, TURNTABLE
4-881-679-00	(LX33/B)....INDIVIDUAL CARTON
4-881-680-00	(LX33C).....INDIVIDUAL CARTON
4-881-685-00	(LX33(A))....INDIVIDUAL CARTON
4-881-686-00	(LX33(A))...CUSHION

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

### SEMICONDUCTORS

In each case, U: μ, for example:  
 UA---: μA---, UPA---: μPA---, UPC---: μPC,  
 UPD---: μPD---

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	▲;1-508-800-13	U TYPE BASE POST 3P
502	▲;1-508-806-13	U TYPE BASE POST
503	▲;1-535-115-00	TERMINAL
504	▲;1-535-117-00	TERMINAL
505	1-551-294-00	CORD
506	▲;1-551-628-00	(US)...CORD, POWER
507	1-555-463-00	(LX33C)...CONNECTOR, WITH LEAD
508	1-561-551-00	CONNECTOR, NECK CYLINDER (M)
509	▲;1-607-274-00	PC BOARD, FG
510	▲;1-607-278-00	PC BOARD, PRIMARY TRANSLATION
511	▲;1-607-279-00	PC BOARD, SERVO
512	▲;1-607-280-00	PC BOARD, PHONO
513	▲;1-607-281-00	PC BOARD, LED
514	▲;1-607-282-00	PC BOARD, SWITCH
515	▲;1-607-283-00	PC BOARD, STAND-BY SWITCH
516	▲;1-607-284-00	PC BOARD, START STOP SWITCH
517	A-4505-069-A	(LX33/(A)/B)...CARTRIDGE COMPLETE ASSY
518	A-4608-214-A	STATOR ASSY
519	▲;A-4619-182-A	MOUNTED PCB, SERVO
520	▲;1-534-817-XX	(AEP)...CORD, POWER, EULO PLUG
521	▲;1-551-962-00	(UK)...CORD, POWER
522	▲;1-551-967-00	(UK)...CORD, POWER
523	1-549-105-00	(LX33C)...CARTRIDGE COMPLETE ASSY
524	A-4587-062-A	(LX33/(A)/B)...STYLUS ASSY
C120	1-123-228-00	ELECT (NONPOLAR) 1MF 20% 50V
D101	▲;8-719-200-02	DIODE 10E2
D102	▲;8-719-200-02	DIODE 10E2
D103	▲;8-719-200-02	DIODE 10E2
D104	▲;8-719-200-02	DIODE 10E2
D105	8-719-910-62	DIODE HZ6A2L
D106	8-719-815-55	DIODE 1S1555
D107	8-719-815-55	DIODE 1S1555
D201	8-719-909-10	DIODE GL9PR10
D202	8-719-909-10	DIODE GL9PR10
H1	8-719-903-00	DIODE HL-300C
H2	8-719-903-00	DIODE HL-300C
IC101	8-759-602-65	IC CX065B
IC102	8-759-145-58	IC UPC4558C
IC103	8-759-145-58	IC UPC4558C
PM1	1-454-196-51	SOLENOID
PM2	1-454-196-51	SOLENOID
PT1	▲;1-447-256-00	(LX33C).....TRANSFORMER, POWER
PT1	▲;1-447-257-00	(LX33/(A)/B)...TRANSFORMER, POWER

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q101	8-729-177-43	TRANSISTOR 2SD774
Q102	8-729-103-43	TRANSISTOR 2SB734
Q103	8-729-177-43	TRANSISTOR 2SD774
Q104	8-729-103-43	TRANSISTOR 2SB734
Q105	8-729-663-47	TRANSISTOR 2SC1364
Q106	8-729-612-77	TRANSISTOR 2SA1027R
Q107	8-729-663-47	TRANSISTOR 2SC1364
Q108	8-729-663-47	TRANSISTOR 2SC1364
Q109	8-729-663-47	TRANSISTOR 2SC1364
Q110	8-729-612-77	TRANSISTOR 2SA1027R
Q111	8-729-663-47	TRANSISTOR 2SC1364
Q112	8-729-663-47	TRANSISTOR 2SC1364
Q113	8-729-663-47	TRANSISTOR 2SC1364
R137	1-244-841-00	CARBON 47 5% 1/2W
RV101	1-226-234-00	RES, ADJ, CARBON 2K
RV102	1-226-234-00	RES, ADJ, CARBON 2K
RV103	1-226-238-00	RES, ADJ, CARBON 50K
RV104	1-226-238-00	RES, ADJ, CARBON 50K
RV105	1-224-661-00	RES, ADJ, METAL GLAZE 50K
RV106	1-226-237-00	RES, ADJ, CARBON 20K
RV107	1-226-237-00	RES, ADJ, CARBON 20K
S1	1-553-331-21	SWITCH, PUSH
S2	1-553-331-21	SWITCH, PUSH
S3	1-553-331-21	SWITCH, PUSH
S4	1-552-928-00	SWITCH
S5	1-553-580-00	SWITCH, KEY BOARD
S6	1-516-657-00	SWITCH, MICRO

**NOTE:**

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- Due to standardization, parts with part numbers (▲-▲▲▲-▲▲▲-XX or ▲-▲▲▲-▲▲▲-X) may be different from those used in the set.

**CAPACITORS:**

- All capacitors are in  $\mu$ F. Common capacitors are omitted. Refer to the following lists for their part numbers.  
MF: $\mu$ F, PF: $\mu$ F.

**RESISTORS**

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

**COILS**

- MMH : mH, UH :  $\mu$ H

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

**SEMICONDUCTORS**

In each case, U :  $\mu$ , for example:  
UA....:  $\mu$ A...., UPA....:  $\mu$ PA...., UPC....:  $\mu$ PC,  
UPD....:  $\mu$ PD....

ELECTROLYTIC CAPACITORS

RATING → : Use the high voltage rated one.						
CAP. (μF)	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47						1-121-726-00
1.0						1-121-391-00
2.2						1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-415-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	—	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	—
3300	1-121-661-00	1-123-075-00	1-123-071-00	—	—	—

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	—	—	—	—
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	—	1-123-028-00
3.3	1-121-995-00	—	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	—	—
47	1-123-251-00	1-121-919-00	—	—
100	1-123-084-00	—	—	—

CERAMIC CAPACITORS

RATING							
CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

0.001μF = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

RATING → : Use the high voltage rated one.					
CAP. (μF)	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

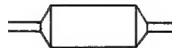
## MYLAR CAPACITORS

RATING											
CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.
	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.		PART No.	PART No.	PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	—	—
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	—	—
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	—	—
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	—	—
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				



## TANTALUM CAPACITORS

RATING							
→ : Use the high voltage rated one.							
CAP. (μF)	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01					→	→	1-131-396-00
0.015					→	→	1-131-397-00
0.022					→	→	1-131-398-00
0.033					→	→	1-131-399-00
0.047					→	→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	—	—	—	—	1-131-412-00	→	1-131-406-00
0.68	—	—	—	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	—	—	1-131-418-00	—	1-131-413-00	→	1-131-408-00
1.5	—	1-131-421-00	—	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	—	1-131-419-00	—	1-131-414-00	1-131-355-00	1-131-349-00
3.3	—	1-131-422-00	—	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	—	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	—	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	—
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	—			
68	1-131-394-00	1-131-388-00	—	—			
100	1-131-395-00	—	—	—			



## TANTALUM CAPACITORS

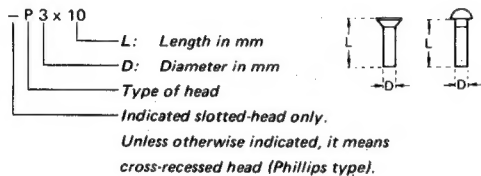
RATING						
CAP. (μF)	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			—	—	1-131-262-00	1-131-278-00
0.33			—	—	1-131-263-00	1-131-279-00
0.47			1-131-169-00	—	1-131-264-00	1-131-280-00
0.68			—	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	—	1-131-266-00	1-131-282-00
1.5		1-131-250-00	—	—	1-131-267-00	1-131-283-00
2.2		—	—	1-131-259-00	1-131-268-00	1-131-284-00
3.3		—	1-131-255-00	—	1-131-269-00	—
4.7		1-131-251-00	1-131-171-00	—	1-131-270-00	—
6.8		—	—	1-131-260-00	1-131-271-00	—
10	—	—	1-131-256-00	—	1-131-272-00	—
15	—	1-131-252-00	—	1-131-261-00		
22	—	—	1-131-257-00	—		
33	1-131-176-00	1-131-253-00	1-131-173-00	—		
47	1-131-288-00	1-131-174-00	—	—		
100	1-131-177-00					

1/4 WATT CARBON RESISTORS

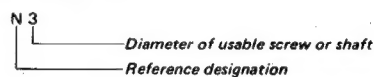
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		













HARDWARE NOMENCLATURE














Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
<b>SCREWS</b>			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazier-head screw	

Reference Designation	Shape	Description	Remarks
<b>SELF-TAPPING SCREWS</b>			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
<b>SET SCREWS</b>			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
<b>NUT</b>			
N		nut	
<b>WASHERS</b>			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
<b>RETAINING RINGS</b>			
E		retaining ring	
G		grip-type retaining ring	

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